SEISENSE JOURNAL OF MANAGEMENT

Volume 05, Issue 01

ISSN: 2617 - 5770 (ONLINE)

SEISENSE Journal of Management
Vol 5 No 1 (2022): DOI: https://doi.org/10.33215/sjom.v5i1.724 , 1-16
Research Article

Does Environmental Knowledge Matter? Social Influence and Pro-Environmental Behavior in University Students: An Indirect Effect Model

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Article History
Received 2021-09-14
Revised 2021-011-11
Revised 2021-12-13
Accepted 2021-12-29
Published 2022-01-01

Keywords
Social influence
Environmental Knowledge
Pro-environmental behavior Environmental Sustainability
University Students

Purpose- This study aims to provide an analytical framework that focuses on environmental knowledge as a mechanism through which social influence enhances pro-environmental behavior among university students.

Design/Methodology- The research employed quantitative strategy, cross-sectional survey design, and systematic random sampling techniques to obtain data from a sample of 335 university students using a structured self-administered questionnaire. The study hypotheses were tested using Hayes Process Macro vs. 3.5 (Model 4).

Findings- Results indicate that social influence strongly impacts students' environmental knowledge, and both variables significantly predict pro-environmental behavior. Environmental knowledge was discovered to be the strongest predictor of pro-environmental behavior among students. Finally, results show that environmental knowledge mediates the relationship between social influence and pro-environmental behavior, revealing a complimentary mediation model superior to the direct effect model.

Originality- These findings reveal that social influence and students' environmental knowledge have a strong influence in cultivating students' pro-environmental behavior. Furthermore, the complementary mediation model, which shows superior results than the direct effect model, contributes to the body of knowledge and offers new insights into theory and practice.

Practical Implications- Environmental sustainability may be positioned as a social trend by government and business agencies, such as a promotional campaign, workshops, and training to demonstrate and raise awareness about environmental issues.

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Introduction

The natural stability of our environment is being broken day by day due to the irresponsible environmental behavior of our society. The earth's health is deteriorating too fast. As we progress to Industry 2.0, the disastrous impact of rapidly expanding industrialization on nature is becoming increasingly dominant in human life. Disasters caused by climate change seem to be on the rise (Tian et al. 2020). We have witnessed the spread of lethal diseases among ordinary citizens who live near industrial zones and cannot move to safer areas due to lack of financial resources and government assistance (Donmez-Turan & Kiliclar, 2021). Clark et al. (2019) and Chuchu et al. (2020) report that China and India have frequent major air and water pollution incidents, massive spikes in carbon emissions, depletion of agriculture, deforestation, reduced biodiversity, hundreds of cancer villages, and energy inefficient growth. According to Clark et al. (2019), it is estimated that over 700,000 people die each year due to causes related to the country's unhealthy environmental conditions. The health implications of high mortality rates, especially among children, are disheartening and can no longer be dismissed as a minor problem (Amoah & Addoah, 2021). Environmental sustainability is therefore a big concern in both developed and developing countries (Khalique et al. 2020) which must be addressed immediately by all.

Recognizing the gravity of the emerging environmental challenges, scholars, intellectuals, scientists, policymakers, and governments worldwide are concerned and committed to seeking solutions (Pronello & Gaborieau, 2018; Sousa et al. 2021). Unfortunately, the global environmental consciousness of this problem is shallow (Donmez-Turan & Kiliclar, 2021). In this study, we argue that the more people are aware of the environmental issues caused by their behavior, the more they can accept responsibility for their actions and the critical role their behavior plays in eradicating these environmental problems. This, in effect, increases the probability of pro-environmental behavior and prompts people to act in an environmentally friendly manner by allowing personal norms to emerge (Donmez-Turan & Kiliclar, 2021; Kim & Stepchenkova, 2020; Li et al. 2020; Shin et al. 2017). However, as previously stated, the most significant impediment to the formation of pro-environmental behavior is a lack of knowledge (Donmez-Turan & Kiliclar, 2021; Geng et al. 2017). It is on this premise, that the current study examines the role of environmental knowledge as a mechanism through which social influence (significant others) can cultivate or enhance pro-environmental behavior in university students.

Sousa et al. (2021) and Ahmad et al. (2021) argue that greenhouse gas emissions, deforestation, pollution, inadequate resource management, and climate change are only a few of the many environmental challenges requiring countries to meet their environmental governance responsibilities while still promoting economic growth without compromising ecological sustainability. However, concern for environmental sustainability takes a back seat in many developed nations as the emphasis is placed on economic growth (Clark et al. 2019). This notion must change. Governments, business organizations, and non-governmental agencies should take immediate steps to address climate change and its repercussions, including the development of human and institutional capital and mechanisms to facilitate effective environmental management to achieve the United Nations 2030 Agenda for Sustainable Development (Ahmad et al. 2021).

According to Sousa et al. (2021), due to the gravity of the environmental issues, there is an increasing focus on individual environmental actions, which may either be environmentally friendly or unfriendly. As a result, environmental preservation and conservation campaigns have risen to the top of the priority list of all stakeholders as a means of responding to this crisis (Kim & Stepchenkova, 2020). Pro-environmental behaviors are described by Afsar et al. (2020) as the discretionary acts that contribute to the sustainability of the environment. On the other hand, Wong et al. (2021) define environmentally friendly behavior or pro-environmental behavior as behavior that deliberately seeks to minimize the adverse effects of one's activities on the ecological system. These pro-environmental behavior or actions are motivated by their social groups, environmental knowledge, value system, and other factors (Esfandiar et al. 2020; Wong et al. 2021).

Literature Review

Theoretical background and hypotheses development

This study is guided by the Value Belief Norm theory, which takes into account the value and norm elements of the Norm Activation Model and the New Environmental Paradigm, that considers the general beliefs and concerns about the environment, as well as measures to combat environmental problems or environmental sustainability (Liobikienė & Poškus, 2019; Nordfjærn & Rundmo, 2019). This theory has been extensively used in analyzing sustainability (Ghazali et al. 2019; Liobikienė & Poškus, 2019; Megeirhi et al. 2020; Wensing et al. 2019), among others. According to Value Belief Norm theory, values influence beliefs, which are assessed through the shared values, beliefs, and social relations (Chuang et al. 2020) that also affects students' environmental knowledge and understanding of their behavioral consequences, an assertion of accountability, which leads to personal norms regarding behavior, and, finally, predicts behavior.

Social influence and Pro-Environmental Behavior

Regardless of their background, humans are usually social creatures that tend to interact with groups of people to fulfill their human needs. In the process, they form social norms that reflect their collective consensus on what and how individual group members should behave, think, and do (Clark et al. 2019). Social influence and norms are strong predictors of human behavior and effective motivators of pro-environmental behavior. For example, Geng et al. (2017) found that social influence is an important motivator for shaping sustainable consumption behavior among Chinese consumers. As members of a social group or society, consumers gather and exchange knowledge among themselves. They consider and associate other people's perceptions, recommendations, or views on the product or service and evaluate them accordingly (Clark et al. 2019; Farrow et al. 2017; Goyal & Goyal, 2021).

According to Han and Xu (2020)'s research, people who obtain recycling information from family and friends are more likely to recycle and have a much more significant influence on an individual's environmental behavior. It's been further noted in the work of Geng et al. (2017) that people who are close to you, such as family and friends, may impact your sustainable consumption habits. The authors suggest that governments and non-governmental agencies may play a critical role in encouraging sustainable consumption behaviors among young Chinese consumers. In assessing the predicting factors affecting consumer motivation in purchasing electric vehicles, Cui et al. (2021) discovered that, in addition to environmental concern, price consciousness, openness to experience, and self-esteem, social influence plays a significant role in influencing the adoption of electric vehicles, which is regarded as one of the leading environmental solutions. On the other hand, Chen et al. (2016) contend that antecedents such as "social influence, environmental concern, self-image, and perceived environmental responsibility" inspire teenagers to purchase environmentally friendly goods.

In another study on the antecedents of green buying behavior in Pakistan, it was noted by Khalique et al. (2020) that green brands, green identification, and social influence were discovered to be significant predictors of green purchasing behavior. The authors further argue that consumers who associate themselves with people who care about the environment will always purchase green or environmentally friendly products. This highlights the strength of social influence in cultivating pro-environmental behavior. As a result, Khare (2019) argues that social influence is essential in persuading others of the functional nature of green brands and assisting such consumers in distinguishing between green and non-green goods.

In a comparative study between the young US and Chinese consumers, Blose et al. (2020) found that Chinese and American students may be receptive to grassroots attempts to encourage recycling behaviors through peer groups, friends, neighbors, and family ties. These groups (important others) significantly influence consumer decision-making, product awareness, and consumption habits. They also play an important role in shaping an

identity of an individual, transmitting certain values and habits; thus, they are an information source that affects both environmental knowledge and pro-environmental behavior (Blose et al. 2020). A similar argument is also presented by Saeed et al. (2019), who found that positive and negative sustainability-related content or information on social media strongly impacts consumers' intentions to buy sustainable goods. Social media users create product-related content to inform one another about a company's sustainable practices and supply chain, thus enhancing environmental knowledge and pro-environmental behavior.

Finally, Matthies et al. (2012) observe that parents influence their children's pro-environmental behavior through sanctions, behavior, and information exchange concerning environmental problems. According to Matthies et al. (2012), parents and other significant people in the child's environment can help the child develop environmental knowledge, concern, and behaviors by serving as role models. Based on this discussion, we propose:

H1: Social influence significantly predicts students' pro-environmental behavior.

H2: Social influence significantly influences students' environmental knowledge.

Environmental Knowledge and Pro-environmental Behavior

Environmental knowledge is a general understanding of the natural environment's reality, principles, and relationships and its main ecosystems (Ahmad et al. 2021). It includes what people know about the environment, the main interactions that contribute to environmental issues or effects, the understanding of the whole processes, and the mutual obligations important for sustainable development. It is also referred to as environmental literacy in the work of Dresner et al. (2015), which implies the ability to perceive and understand the relative health of environmental systems and to take effective action to preserve, restore or improve health of those systems.

According to Amoah and Addoah (2021), it is expected that the more knowledgeable a person is, the more concerned they will be about environmental issues. People who are well-informed practice environmentally friendly behaviors in their daily lives, and they play a significant role in influencing environmental advancements through a variety of environmentally friendly behaviors (Kim et al. 2021). However, prior environmental knowledge studies have reported mixed results on taking the right steps to protect the environment. For example, Di Martino et al. (2019)'s study shows that consumers have moved from being motivated by knowledge of green products to environmental attitudes. According to the authors, consumer environmental knowledge no longer affects how they feel about green or environmentally friendly products. These contradictory findings are also reported in the work of Vicente-Molina et al. (2013), who indicated no significant relationship between environmental knowledge and pro-environmental behavior. Their findings suggest that the degree to which a person knows about a type of product or brand does not influence their green buying intentions. Additionally, Lee (2011) observed that environmental knowledge did not turn into a desire to pay more for eco-friendly apparel. This has been further reported in other recent studies (Chekima et al. 2016; Leonidou & Skarmeas, 2017; Zarei & Maleki, 2018) which have revealed that environmental knowledge does not significantly influence green consumer behavior.

While several studies have shown that knowledge alone is not enough to influence pro-environmental behavior, most studies have established that it is a prerequisite for a person's pro-environmental behavior (Vicente-Molina et al. 2018). According to Amoah and Addoah (2021)'s research on the relationship between environmental knowledge and pro-environmental behavior in developing countries, with a focus being on Ghana, environmental knowledge was found to be beneficial and statistically significant in understanding pro-environmental behavior. This is further supported by the findings of Chekima et al. (2016), which shows that customers with high environmental knowledge are more likely to purchase green or environmentally friendly

products when faced with possible price barriers and understanding of green goods, indicating that overall environmental knowledge plays a significant role in green purchasing intentions.

Moreover, a study by Heo and Muralidharan (2019) found that ecological concern and knowledge are important predictors of young Millennials purchasing eco-friendly products. This is further supported by several other studies (Alhosseini Almodarresi et al. 2019; Boeve-de Pauw et al. 2019; Liobikienė & Poškus, 2019; Mostafa, 2006; Otto & Pensini, 2017), which have proposed that the promotion of environmental information and education can serve as practical tools both to improve environmental behavior as well as contribute to the reduction of environmental impacts. Consumers with greater knowledge and understanding of environmental issues are more likely to use green products, but lack of them contributes to insensitivity to environmental sustainability (Alhosseini Almodarresi et al. 2019). Green consumers are well-educated, younger, and superior to non-green consumers (Shukla, 2019). Therefore, it is argued in this study that individuals with greater environmental knowledge are more likely to behave responsibly towards protecting the environment.

Despite environmental knowledge being used as a predictor of pro-environmental behavior, very few studies have used it as a mediator or mechanism through which the outcome variable can be enhanced. For example, Ode and Ayavoo (2020) investigated the role of knowledge application as a mediator between knowledge management and firm innovation in Nigeria. Their findings confirm the mediation process on the study variables. In addition, Jung et al. (2011) examined the indirect effect of knowledge and efficacy on the link between communication and political participation in America. Results from the study support the idea that knowledge plays a significant role as a mediator. A study conducted in Malaysian Universities to assess academics' green behavior, the role of green human resource management, and environmental knowledge by Fawehinmi et al. (2020) discovered that knowledge mediates the process under investigation. This is further confirmed by Zheng et al. (2010), who discovered that experience or knowledge completely mediates the impact of organizational culture on organizational effectiveness. Thus, this study contends that favorable pro-environmental behaviors in young consumers can be effectively attained through social influences and environmental understanding or knowledge (Abrahamse & Steg, 2013).

Given the variety of previous research findings, one important objective of this paper would be to determine how students' environmental knowledge mediates the relationship between social influence and pro-environmental behavior. Thus, we propose:

H3: Environmental knowledge significantly predicts students' pro-environmental behavior.

H4: Environmental knowledge mediates the relationship between social influence and students' pro-environmental knowledge.

Covariates

To minimize exogenous risks to the study model, three demographic factors, gender, age, and type of college students enrolled, were viewed as covariates. These variables have been found to significantly influence pro-environmental behavior (Hansmann et al. 2020; Mostafa, 2007; Patel et al. 2017).

Research Methodology

A closed-ended self-administered questionnaire was used to collect data from a sample size of 335 respondents who were University of Nairobi students in Kenya. The participants were grouped into six colleges (Health Sciences, Education and External Studies, Architecture and Engineering, Humanities and Social Sciences, Agriculture and Veterinary Science, Biological and physical). A cross-sectional survey design and systematic sampling technique were used in data collection. Three hundred eighty-four questionnaires were distributed, and three hundred thirty-five were returned, indicating an 87 % response rate. According to the findings in

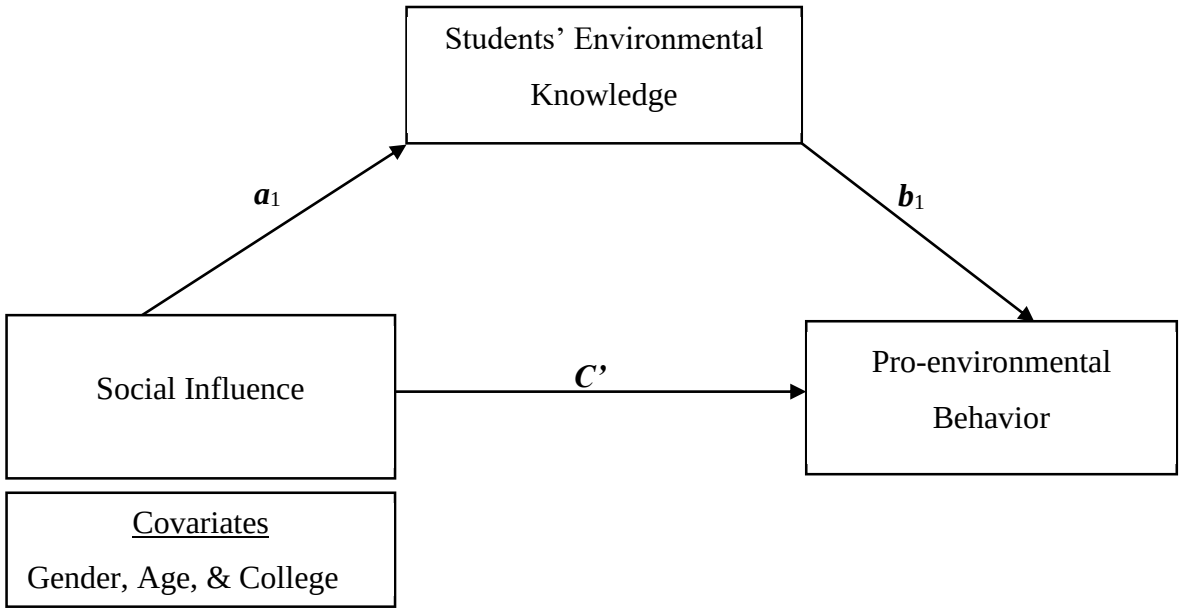

***Figure 1**: Conceptual Model*

***Source**: Hayes (2018) Model 4*

table I, 57.3 % were males, and 42.7 % were females; 69.2 % were between the ages of 18 and 23; most respondents, 44.8 %, were from the College of Education and External Studies, with the least 4.8% coming from the College of Biological and Physical Science.

***Table 1:** Respondents Demographic Profile*

Variable	Demographic factor	Respondents	% no. of respondents
Gender	Female	143	42.7
	Male	192	57.3
	Total	**335**	**100**
Age	18-23	232	69.2
	24-29	86	25.7
	30-35	12	3.6
	36-41	3	.9
	42-47	1	.3
	Above 48	1	.3
	Total	**335**	**100**
College	Agriculture & Veterinary Science	47	14.0
	Architecture & Engineering	19	5.7
	Humanities and social	84	25.0
	Health Science	19	5.7
	Education & External studies	150	44.8
	Biological & Physical	16	4.8
	Total	**335**	**100**

Measurement

Variables in this study were assessed using several item scales adapted from previous studies with minor modifications to fit the current study context. Ten (10) items measuring pro-environmental behavior were adapted from Robertson and Barling (2017), five items (5) measuring social influence from Rehman and Dost (2013), and six (6) items measuring environmental knowledge from Mostafa (2007). Respondents were requested to indicate their level of agreement/disagreement with each item on a five Likert scale ranging from (1) 'strongly disagree' to (5) 'strongly agree.' Finally, covariates were measured as; gender "0" for females and "1" for males, age categorized in six (6) categories, and colleges categorized in seven different groups of "1 to 7".

Results

Descriptive Statistics

Findings of descriptive statistics for the study variables are presented in **Table 2.** Results show that social influence has the highest mean = 4.18, with a standard deviation = .526. Environmental knowledge had the second highest mean = 3.87, standard deviation = .723, while pro-environmental behavior had the least mean of 3.78, standard deviation = .612, respectively. The reliability test results of the instrument are also presented in **Table 2.** Findings indicate that all variables had Cronbach's Alpha values above .5, with pro-environmental 10 items having the highest α = .914, social influence α = .801, and environmental knowledge having the least α =. 543. The table further reveals results of correlation analysis which indicate that environmental knowledge has the highest relationship with pro-environmental behavior with r =.638, p <.01, while social influence had the least score r =.557, p <.01. Finally, findings also indicate that social influence has a significant relationship with environmental knowledge with r =.389, p <.01.

Testing for Construct Validity

Factor analysis was performed before testing the study hypotheses using the Principal Component extraction method with Varimax rotation analysis. Eigenvalues greater than 1 (one) was used to create and describe the study variables. Furthermore, any item that did not meet the requirements of having a factor loading value higher than.5 and loading on only 1 (one) factor was excluded. Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO) was used to confirm the appropriateness of factorability. As shown in **Table 3**, the KMO value was .875, with Bartlet's Test of Sphericity revealing a Chi-Square of 2714.891 with df = 210, which was significant at p = .000. The table results show that three factors derived from twenty-one (21) items account for approximately 50% of the total variance. Factor 1 (one) had ten (10) items measuring pro-environmental behavior loaded on it. Findings show that this factor was responsible for approximately 28% of the variance. Five (5) items assessing social influence variable loaded on factor 2 (two) with results indicating that it roughly explains 15% percent of the variance. Finally, the results show that factor 3 (three) had three (3) items measuring environmental knowledge loaded on it and three others excluded because they did not load. This factor accounts for roughly 8% of the total variance.

Table 2: *Findings of Descriptive statistics, Reliability test, and Correlation Analysis*

Variable	M	SD	α	Correlation		
Pro-environmental Behavior	3.78	.612	.914	1		
Social Influence	4.18	.526	.801	.557**	1	
Environmental Knowledge	3.87	.723	.543	.638**	.389**	1

Note: Correlation is significant at ** significant at 0.01 level (2-tailed).

***Table 3**: Findings of Factor Analysis*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.875
Bartlett's Test of Sphericity	Chi-Square			2714.891
	df			210
	Significance			.000
Study variables		Eigen Value	% Var	Total %
1. Pro-environmental Behavior		5.83	27.78	27.78
2. Social Influence		3.13	14.92	42.70
3. Environmental Knowledge		1.59	7.60	50.30
Items Loadings		1	2	3
At college, I recycle whenever possible.		.665		
I help my college mates to be environmentally friendly		.686		
I conserve the number of materials I use at college		.789		
I promote environmentally friendly behaviors amongst my college mates		.817		
I persuade my institution to purchase environmentally friendly products		.758		
At college, I reduce the amount of energy I use		.730		
I discuss with colleagues how our institution can be environmentally friendly		.742		
I participate in environmentally-friendly events sponsored by my institution		.779		
I suggest to my college mates how to reduce the number of materials they use		.786		
I encourage my institution to support environmental charities.		.745		
I learn a lot about green products from my friends			.792	
I learn about environmental issues from my friends			.819	
I discuss with my friends environmentally friendly products			.761	
I Discuss with my friends' environmental issues			.688	
I always buy environmentally friendly products with my friends			.604	
I know more about recycling than the average person				.658
I know how to select products and packages that reduce environmental waste				.624
I understand the environmental phrases and symbols on product packages				.631
Consumers with higher eco knowledge have higher pro-environmental behavior				**RM**
I am very knowledgeable about environmental issues.				**RM**
I know that i buy products and packaging that are environmentally safe				**RM**

Note: Var = Variance, RM = Items removed from the study

Hypotheses Testing

In this study, four hypotheses were developed and tested using Hayes (2018) Process Macro vs 3.5 (Model 4). First, we investigated whether social influence would predict students' pro-environmental behavior; covariates were included in all analyses. **Table 4**, **Model 2** findings show that the type of college a student attends has a significant but negative impact on their pro-environmental behavior = -.168, *p-v* =.000, as all other covariates were insignificant as indicated by p >.05. However, results reveal that social influence positively and significantly influences pro-environmental behavior as shown by β = .289, *p-v* =.000 (path ***C'*** of **Figure 1**). Results further show that this model accounts for 58.4% of the total variance in students' environmental behavior as indicated by R^2.584, with F= 92.260, significant at *p*-v = .000. Based on these results, H1 is supported by the study.

Second, we hypothesized that social influence would considerably impact students' environmental knowledge (H2). According to the findings in **Table 4, Model 1**, all covariates were insignificant. The results also show that social influence positively and significantly predicts students' pro-environmental behavior, as demonstrated

by =.396, *p-v* =.000 (path a_1 of **Figure 1** of the conceptual model). The results show that this model has R^2.162, F=15.897, significant at *p-v* =.000. As per R^2.162, the model explains 16.2 % of students' environmental knowledge. Based on these results, hypothesis H2 is also supported.

Thirdly, the study sought to examine the influence of students' environmental knowledge on their pro-environmental behavior (indicated as path b_1 of the conceptual model, **Figure 1**). Results reveals that environmental knowledge significantly influences pro-environmental behavior as shown by β = .502, p-v =.000, thus, hypothesis H3 is also supported by the study findings. The findings of this hypothesis are also shown in **Model 2** of **Table 4**, indicated as b_1.

Finally, the study used MacKinnon's (2012) mediation guidelines to determine whether students' environmental knowledge mediates the link between social influence and students' pro-environmental behavior. These guidelines are;

1. The predictor variable (X= Social influence) must significantly influence the mediator variable (M= Environmental Knowledge) shown as path a_1 of **Figure 1.**
2. Mediator variable (M = Environmental knowledge) must significantly associate with the outcome variable (Y = Pro-environmental behavior) …. path b_1 of **Figure 1**.
3. Testing the association between the predictor variable (X = Social influence) and the outcome variable (Y = Pro-environmental behavior) while controlling for the mediator variable (M = Environmental Knowledge) indicated as path ***C'*** of Figure 1. This does not need to be significant for mediation to exist. This condition determines the nature of mediation in a study (Zhao et al. 2010). According to Zhao et al. (2010), the presence of both direct effect (path ***C'***) and mediated effect (a_1× b_1) with both having the same sign, either positive (+ve) or negative (-ve), reveals a ***complimentary mediation***. However, if both exist (direct and indirect effect) but with opposite signs (one +ve and the other -ve sign), it indicates a ***Competitive mediation.*** Finally, the absence of a significant direct effect (path ***C'***) and the presence of a significant (a_1 × b_1) reveals an ***Indirect-only mediation.***
4. Finally, there should be a significant coefficient for the indirect effect of the predictor variable (social influence) on the outcome variable (pro-environmental behavior) via the mediator variable (environmental knowledge) (a_1 × b_1). To determine if this last condition is met, the results of both confidence intervals (Lower and Upper Limit) must be zero.

Based on the above guideline, the study results in **Table 4**, **Model 1** indicate that social influence (X) significantly influences environmental knowledge (M), path a_1 with β = .396, *p* =.000, thus the first condition '**1**' is confirmed. Results of **Table 4**, **Model 2** shows that environmental knowledge predicts pro-environmental behavior, path b_1 with β = .502, *p* =.000. Hence the second condition, '**2**,' is also confirmed. The same **Model 2** reveals that social influence has a significant relationship with students' pro-environmental behavior, path ***C*** with β = .289, *p* =.000. This also confirms step three '**3**.'

Following the four guidelines established by Zhao et al. (2010) discussed above, the study results revealed that the mean indirect effect from the bias-corrected percentile bias bootstrap analysis was positive and significant, a_1× b_1 =.396 ×.502 =.199, SE = 030, CI =.141,.256. Since both confidence intervals (CI) do not cross zero, results confirm the presence of mediation.

Finally, results indicate both direct effect (*C'*=.289) and indirect effect (a_1× b_1) =.289×.502 =.199) with both results having the same positive (+ve) signs, thus, revealing a ***complimentary mediation***. Total Effect findings

(direct + indirect effect) = .289 + .199 =.488 shown in **Model 3** of the same table suggest that the two processes collectively make a significant contribution to the Total effect model, which seems to be a better model with a higher value (β =.488) than when assessing the direct effect model alone (β =.289). The covariate results show that the type of college a student currently enrolled in was significant with β = -.161, *p* =.000, as the rest were found to be insignificant. Furthermore, findings show that this model explains approximately 37% (R^2.372) of the variance with a significant F = 48.973, *p* =.000. Based on these results, hypothesis H4 is also supported by the study.

***Table 4**: Outcome of Regression and Hypotheses*

Predictor	Model 1 (EK)		Model 2 (PEB)		Model 3 (Total Effect)	
	β	*p-v*	β	*p-v*	β	*p-v*
Constant	-.069	.705	.541***	.000	.507***	.001
Gender	.190	.063	.020	.781	.116	.192
Age	-.067	.375	.059	.271	.025	.700
College	.014	.684	-.168***	.000	-.161***	.000
Social influence	a_1= .396***	.000	C' = .289***	.000	.488***	.000
Environ knowledge	-	-	b_1 = .502***	.000	-	-
R^2	.162		.584		.372	
F	15.897***		92.260***		48.973***	
Mediation Results =	$a_1 \times b_1$ = .396 × .502		=. 199, SE = 030		CI = .141, .256	

Note: *** significant at *p* <.001, Environ knowledge, EK = Environmental Knowledge, PEB = Pro-environmental Behavior

Discussion

This study proposed three direct and one indirect hypotheses based on theoretical support, which was empirically tested using data obtained from University of Nairobi students as respondents. Hypothesis H1 postulated that social influence would predict students' pro-environmental behavior. Results from the analysis supported this hypothesis. These findings are in line with prior studies, which have indicated that consumers' behavior is frequently influenced by their social groups, and they would always want to associate with people who care about environmentally friendly products (Blose et al. 2020; Geng et al. 2017; Khalique et al. 2020; Khare, 2019; Li & Wu, 2020; Thormann & Wicker, 2021).

For example, Thormann and Wicker (2021) discovered that social norms (social influence) are significantly related to pro-environmental behavior in a study conducted in Germany on the determinants of pro-environmental behavior among voluntary sport club members. The study results are also consistent with the findings of Blose et al. (2020), who identified that social groups, acquaintances, neighbors, and family relationships play an essential role in cultivating recycling behaviors in the young US and Chinese consumers. This is further supported by Khalique et al. (2020), who observed that social influence significantly impacts green purchasing behavior in a study on consumers' attitudes toward green consumerism in Pakistan. Furthermore, regardless of their positive attitudes, a lack of social influence from important people may prevent students from participating in this process of pro-environmental sustainability (Liao & Li, 2019).

The study findings on hypothesis H2 revealed that social influence positively and significantly influences students' environmental knowledge. As members of a social group or community, consumers gather and share information. They recognize and associate other people's perceptions of the product or service and evaluate them accordingly as to whether they are environmentally friendly or not (Clark et al. 2019). These findings are in line with Wan et al. (2017), whose study found that subjective norms may increase the likelihood of recycling

for people who have a positive experience-based attitude and motivate people who have limited knowledge about the benefits of recycling behaviors.

This is further supported by the study findings of Matthies et al. (2012), who found that parents seemed to influence their children's recycling behavior through sanctions and their behavior, and that re-use of paper was primarily influenced through the communication of problem knowledge. Their findings revealed that the child's social and personal norms and the parent's descriptive norms account for 75% of the children's self-reported recycling behavior. Relating these findings to the current study, it implies that the more intense the information from peers, friends, family members, and neighbors, the better the understanding of the dangers of unsustainable environmental practices (Asih et al. 2020). Hence, social influence contributes significantly to increased environmental knowledge, which leads to pro-environmental behavior.

Thirdly, we hypothesized environmental knowledge would significantly predict students' pro-environmental behavior (H3). Results of the analysis also supported this hypothesis. This is consistent with many previous studies (Alhosseini Almodarresi et al. 2019; Aman et al. 2012; Boeve-de Pauw et al. 2019; Chekima et al. 2016; Mostafa, 2006; Shukla, 2019) among others, who found that the more informed and knowledgeable customers become, the greater their potential for environmental sustainability and the more they are willing to take pro-environmental action (Oğuz & Kavas, 2010). However, our findings contradict several other studies (Chekima et al. 2016; Leonidou & Skarmeas, 2017; Zarei & Maleki, 2018), who found the nonsignificant role of environmental knowledge in influencing green consumerism.

Lastly, we sought to determine the mediating effect of environmental knowledge on the relationship between social influence and students' pro-environmental behavior (H4). Our findings suggest that environmental knowledge can be a powerful tool or mechanism for social influence to cultivate pro-environmental behavior in young consumers. The study discovered a *complementary mediation* in which social influence and environmental knowledge contributed to a much more superior result than the direct effect model. This interplay has received little or no attention in the context of pro-environmental behavior, providing new insight and contributing to environmental sustainability literature and theory.

Implications of The Study

The obtained results of the current study can be used to infer meaningful theoretical, managerial, marketing, and policy makers' implications in fostering environmental sustainability. Theoretically, the findings have supported prior literature and the theory of Value-Belief-Norm, which explains how students' environmental knowledge is influenced by shared values and beliefs from significant others, which leads to enhanced personal norms regarding behavior, subsequently predicting pro-environmental behavior. Social influence from parents, peers, friends, teachers, and celebrities is critical in increasing an individual's motivation to engage in pro-environmental behavior because it increases the willingness of both those with extensive knowledge and those who are unaware of the benefits of environmental protection (Blose et al. 2020; Khare, 2019; Wan et al. 2017). As a result, both government and business agencies may position environmental sustainability as a social trend, for example, through a promotional campaigns, workshops, and training to demonstrate and raise awareness about environmental issues (Wan et al., 2017).

Secondly, environmental knowledge has been recognized as a powerful predictor of pro-environmental behavior in this study as indicated by $\beta = .502$, $p < .05$. In addition, it has been proved to be a robust mechanism (mediator variable) through which social influence can enhance pro-environmental behavior. These results demonstrate that when students receive adequate support, awareness, encouragement, and involvement of ecological sustainability from parents, teachers, peers, or friends, their environmental knowledge ignites environmentally friendly behavior (Fawehinmi et al. 2020). Thus, young consumers can be involved in environmental initiatives to help raise their awareness or understanding through social networking sites and

consumer blogs to spread the word about the environmental benefits of sustainability (Khare, 2019). Additionally, marketers should identify appropriate messages that provide background information regarding environmental issues about products or services or organizations and illustrate how such a product, service, or organization can help to alleviate environmental problems (Heo & Muralidharan, 2019).

Limitations and Future studies

This study has some limitations that can be used for future research. The current study was conducted in Kenya at a single public university with six different colleges. Before making broad generalizations, a broad scope is recommended. Furthermore, due to differences in cultural backgrounds, this study cannot be generalized to other countries; consequently, caution should be exercised when interpreting this study's findings. Additionally, the methodology used in this study is cross-sectional, which does not reflect how the processes investigated in this study perform over time. A longitudinal research design could be used to provide more justification for the assertions made in this study.

Conclusion

This study provides some useful insights into cultivating pro-environmental behavior in young consumers in developing economies. According to the study's findings, social influence and environmental knowledge significantly predict pro-environmental behavior. The findings also revealed that environmental knowledge plays an important role as a mediator in enhancing the relationship between social influence and students' pro-environmental behavior, revealing a complimentary mediation model that is superior to the direct effect model when tested.

Funding: No funds, grants, or other support was received**.**

Acknowledgments: We thank God for His Grace and Mercy in guiding us in the entire process of carrying out and writing this research work.

Conflicts of Interest: The authors declare no conflict of interest.

References

Abrahamse, W., & Steg, L. (2013). Social influence approaches to encourage resource conservation: A meta-analysis. Global environmental change, 23(6), 1773-1785.

Afsar, B., Maqsoom, A., Shahjehan, A., Afridi, S. A., Nawaz, A., & Fazliani, H. (2020). Responsible leadership and employee's proenvironmental behavior: The role of organizational commitment, green shared vision, and internal environmental locus of control. Corporate Social Responsibility and Environmental Management, 27(1), 297-312.

Ahmad, S., Islam, T., Sadiq, M., & Kaleem, A. (2021). Promoting green behavior through ethical leadership: a model of green human resource management and environmental knowledge. Leadership & Organization Development Journal, 42(4), 531-547. doi: 10.1108/lodj-01-2020-0024

Alhosseini Almodarresi, S. M., Tabataba'i-Nasab, S. M., Bagheri Garabollagh, H., & Mohammadi, F. (2019). Does citizenship behavior have a role in changing attitude toward green products? International Journal of Management Science and Engineering Management, 14(4), 284-292.

Aman, A. L., Harun, A., & Hussein, Z. (2012). The influence of environmental knowledge and concern on green purchase intention the role of attitude as a mediating variable. British Journal of Arts and Social Sciences, 7(2), 145-167.

Amoah, A., & Addoah, T. (2021). Does environmental knowledge drive pro-environmental behaviour in developing countries? Evidence from households in Ghana. Environment, Development and Sustainability, 23(2), 2719-2738.

Asih, D., Setini, M., Soelton, M., Muna, N., Putra, I., Darma, D., & Judiarni, J. (2020). Predicting green product consumption using theory of planned behavior and reasoned action. Management Science Letters, 10(14), 3367-3374.

Blose, J. E., Mack, R. W., Pitts, R. E., & Xie, H. Y. (2020). Exploring young US and Chinese consumers' motivations to recycle. Journal of International Consumer Marketing, 32(1), 33-46.

Boeve-de Pauw, J., Van Hoof, J., & Van Petegem, P. (2019). Effective field trips in nature: the interplay between novelty and learning. Journal of Biological Education, 53(1), 21-33.

Chekima, B., Chekima, S., Syed Khalid Wafa, S. A. W., Igau, O. A., & Sondoh Jr, S. L. (2016). Sustainable consumption: the effects of knowledge, cultural values, environmental advertising, and demographics. International Journal of Sustainable Development & World Ecology, 23(2), 210-220.

Chekima, B., Wafa, S. A. W. S. K., Igau, O. A., Chekima, S., & Sondoh Jr, S. L. (2016). Examining green consumerism motivational drivers: does premium price and demographics matter to green purchasing? Journal of Cleaner Production, 112, 3436-3450.

Chen, Y.-S., Tien, W.-P., Lee, Y.-I., & Tsai, M.-L. (2016). Greenwash and green brand equity. Paper presented at the 2016 Portland International Conference on Management of Engineering and Technology (PICMET).

Chuang, F., Manley, E., & Petersen, A. (2020). The role of worldviews in the governance of sustainable mobility. Proceedings of the National Academy of Sciences, 117(8), 4034-4042.

Chuchu, T., Maziriri, E. T., & Mototo, L. (2020). A Review of the Impact of Consumerism, Recycling and Pollution: Evidence from Southeast Asia: 1999 to 2019. Journal of Environmental Management & Tourism, 11(1 (41)), 23-28.

Clark, R. A., Haytko, D. L., Hermans, C. M., & Simmers, C. S. (2019). Social influence on green consumerism: country and gender comparisons between China and the United States. Journal of International Consumer Marketing, 31(3), 177-190.

Cui, L., Wang, Y., Chen, W., Wen, W., & Han, M. S. (2021). Predicting determinants of consumers' purchase motivation for electric vehicles: An application of Maslow's hierarchy of needs model. Energy Policy, 151, 112167. doi: https://doi.org/10.1016/j.enpol.2021.112167

Di Martino, J., Nanere, M. G., & DSouza, C. (2019). The effect of pro-environmental attitudes and eco-labelling information on green purchasing decisions in Australia. Journal of Nonprofit & Public Sector Marketing, 31(2), 201-225.

Donmez-Turan, A., & Kiliclar, I. E. (2021). The analysis of pro-environmental behaviour based on ecological worldviews, environmental training/knowledge and goal frames. Journal of Cleaner Production, 279, 123518.

Dresner, M., Handelman, C., Braun, S., & Rollwagen-Bollens, G. (2015). Environmental identity, pro-environmental behaviors, and civic engagement of volunteer stewards in Portland area parks. Environmental Education Research, 21(7), 991-1010.

Esfandiar, K., Dowling, R., Pearce, J., & Goh, E. (2020). Personal norms and the adoption of pro-environmental binning behaviour in national parks: An integrated structural model approach. Journal of Sustainable Tourism, 28(1), 10-32.

Farrow, K., Grolleau, G., & Ibanez, L. (2017). Social norms and pro-environmental behavior: A review of the evidence. Ecological Economics, 140, 1-13.

Fawehinmi, O., Yusliza, M. Y., Mohamad, Z., Faezah, J. N., & Muhammad, Z. (2020). Assessing the green behaviour of academics: The role of green human resource management and environmental knowledge. International Journal of Manpower, 41(7), 879-900.

Geng, D., Liu, J., & Zhu, Q. (2017). Motivating sustainable consumption among Chinese adolescents: An empirical examination. Journal of Cleaner Production, 141, 315-322.

Ghazali, E. M., Nguyen, B., Mutum, D. S., & Yap, S.-F. (2019). Pro-environmental behaviours and Value-Belief-Norm theory: Assessing unobserved heterogeneity of two ethnic groups. Sustainability, 11(12), 3237.

Goyal, M., & Goyal, R. K. (2021). Confirming Antecedents of Green Consumption Intention: A Sustainable Model for Food Aggregators. IETE Journal of Research, 67(5), 634-645. doi: 10.1080/03772063.2021.1906336

Han, R., & Xu, J. (2020). A Comparative study of the role of interpersonal communication, traditional media and social media in pro-environmental behavior: A China-based study. International journal of environmental research and public health, 17(6), 1883.

Hansmann, R., Laurenti, R., Mehdi, T., & Binder, C. R. (2020). Determinants of pro-environmental behavior: A comparison of university students and staff from diverse faculties at a Swiss University. Journal of Cleaner Production, 268, 121864. doi: https://doi.org/10.1016/j.jclepro.2020.121864

Hayes, A. F. (2018). Introduction to mediation, moderation, and conditional process analysis second edition: A regression-based approach.: New York, NY: Guilford Publications, Inc.

Heo, J., & Muralidharan, S. (2019). What triggers young Millennials to purchase eco-friendly products?: the interrelationships among knowledge, perceived consumer effectiveness, and environmental concern. Journal of Marketing Communications, 25(4), 421-437.

Jung, N., Kim, Y., & De Zúniga, H. G. (2011). The mediating role of knowledge and efficacy in the effects of communication on political participation. Mass Communication and Society, 14(4), 407-430.

Khalique, M., Iftikhar, S., bin Yaacob, M. R., & Tahir, A. (2020). Antecedents and Mediating Role of Green Buying Behavior. Market Forces, 15(2), 22-22.

Khare, A. (2019). Green Apparel Buying: Role of Past Behavior, Knowledge and Peer Influence in the Assessment of Green Apparel Perceived Benefits. Journal of International Consumer Marketing, 1-17. doi: 10.1080/08961530.2019.1635553

Kim, M.-S., & Stepchenkova, S. (2020). Altruistic values and environmental knowledge as triggers of pro-environmental behavior among tourists. Current Issues in Tourism, 23(13), 1575-1580.

Kim, Y. D., Nam, C., & LaPlaca, A. M. (2021). Marketing and communicating sustainability through college athletics: the effects of pro-environmental initiatives on the belief-attitude-intention hierarchy. Journal of Marketing for Higher Education, 1-21. doi: 10.1080/08841241.2021.1892897

Lee, S. (2011). Consumers' value, environmental consciousness, and willingness to pay more toward green-apparel products. Journal of Global Fashion Marketing, 2(3), 161-169.

Leonidou, C. N., & Skarmeas, D. (2017). Gray shades of green: Causes and consequences of green skepticism. Journal of business ethics, 144(2), 401-415.

Li, Q., & Wu, M. (2020). Tourists' pro-environmental behaviour in travel destinations: Benchmarking the power of social interaction and individual attitude. Journal of Sustainable Tourism, 28(9), 1371-1389.

Li, W., Lee, P. K., Chan, J. C., & Tan, H. (2020). Cultivating environmentally responsible citizens in a local university in Hong Kong-evaluating the cognitive, attitudinal, and behavioral outcomes. International Research in Geographical and Environmental Education, 29(4), 301-315.

Liao, C., & Li, H. (2019). Environmental Education, Knowledge, and High School Students' Intention toward Separation of Solid Waste on Campus. International Journal of Environmental Research and Public Health, 16(9), 1659; doi: 10.3390/ijerph16091659

Liobikienė, G., & Poškus, M. S. (2019). The Importance of Environmental Knowledge for Private and Public Sphere Pro-Environmental Behavior: Modifying the Value-Belief-Norm Theory. Sustainability, 11(12), 3324.

MacKinnon, D. (2012). Introduction to statistical mediation analysis: Routledge.

Matthies, E., Selge, S., & Klöckner, C. A. (2012). The role of parental behaviour for the development of behaviour specific environmental norms–The example of recycling and re-use behaviour. Journal of Environmental Psychology, 32(3), 277-284.

Megeirhi, H. A., Woosnam, K. M., Ribeiro, M. A., Ramkissoon, H., & Denley, T. J. (2020). Employing a value-belief-norm framework to gauge Carthage residents' intentions to support sustainable cultural heritage tourism. Journal of Sustainable Tourism, 28(9), 1351-1370.

Mostafa, M. M. (2006). Antecedents of Egyptian consumers' green purchase intentions: A hierarchical multivariate regression model. Journal of international consumer marketing, 19(2), 97-126.

Mostafa, M. M. (2007). Gender differences in Egyptian consumers' green purchase behaviour: the effects of environmental knowledge, concern and attitude. International Journal of Consumer Studies, 31(3), 220-229.

Nordfjærn, T., & Rundmo, T. (2019). Acceptance of disincentives to driving and pro-environmental transport intentions: the role of value structure, environmental beliefs and norm activation. Transportation, 46(6), 2381-2396.

Ode, E., & Ayavoo, R. (2020). The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation. Journal of Innovation & Knowledge, 5(3), 210-218.

Oğuz, D., & Kavas, S. (2010). Environmental awareness of university students in Ankara, Turkey. African Journal of Agricultural Research, 5(19), 2629-2636.

Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. Global Environmental Change, 47, 88-94.

Patel, J., Modi, A., & Paul, J. (2017). Pro-environmental behavior and socio-demographic factors in an emerging market. Asian Journal of Business Ethics, 6(2), 189-214.

Pronello, C., & Gaborieau, J.-B. (2018). Engaging in pro-environment travel behaviour research from a psycho-social perspective: A review of behavioural variables and theories. Sustainability, 10(7), 2412.

Rehman, Z.-u., & Dost, M. B. (2013). Conceptualizing green purchase intention in emerging markets: An empirical analysis on Pakistan. Paper presented at the The 2013 WEI International Academic Conference Proceedings.

Robertson, J. L., & Barling, J. (2017). Toward a new measure of organizational environmental citizenship behavior. Journal of Business Research, 75, 57-66.

Saeed, M. A., Farooq, A., Kersten, W., & Abdelaziz, S. I. B. (2019). Sustainable product purchase: does information about product sustainability on social media affect purchase behavior? Asian Journal of Sustainability and Social Responsibility, 4(1), 1-18.

Shin, Y. H., Im, J., Jung, S. E., & Severt, K. (2017). Consumers' willingness to patronize locally sourced restaurants: The impact of environmental concern, environmental knowledge, and ecological behavior. Journal of Hospitality Marketing & Management, 26(6), 644-658.

Shukla, S. (2019). A Study on Millennial Purchase Intention of Green Products in India: Applying Extended Theory of Planned Behavior Model. Journal of Asia-Pacific Business, 20(4), 322-350.

Sousa, S., Correia, E., Leite, J., & Viseu, C. (2021). Environmental knowledge, attitudes and behavior of higher education students: a case study in Portugal. International Research in Geographical and Environmental Education, 30(4), 348-365. doi: 10.1080/10382046.2020.1838122

Thormann, T. F., & Wicker, P. (2021). Determinants of pro-environmental behavior among voluntary sport club members. German Journal of Exercise and Sport Research, 51(1), 29-38.

Tian, H., Zhang, J., & Li, J. (2020). The relationship between pro-environmental attitude and employee green behavior: the role of motivational states and green work climate perceptions. Environmental Science and Pollution Research, 27(7), 7341-7352.

Vicente-Molina, M., Fernández-Sainz, A., & Izagirre-Olaizola, J. (2018). Does gender make a difference in pro-environmental behavior? The case of the Basque Country University students. Journal of Cleaner Production, 176, 89-98.

Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, J. (2013). Environmental knowledge and other variables affecting pro-environmental behaviour: comparison of university students from emerging and advanced countries. Journal of Cleaner Production, 61, 130-138.

Wan, C., Shen, G. Q., & Choi, S. (2017). Experiential and instrumental attitudes: Interaction effect of attitude and subjective norm on recycling intention. Journal of Environmental Psychology, 50, 69-79.

Wensing, J., Carraresi, L., & Bröring, S. (2019). Do pro-environmental values, beliefs and norms drive farmers' interest in novel practices fostering the Bioeconomy? Journal of environmental management, 232, 858-867.

Wong, I. A., Wan, Y. K. P., Huang, G. I., & Qi, S. (2021). Green event directed pro-environmental behavior: an application of goal systems theory. Journal of Sustainable Tourism, 29(11-12), 1948-1969. doi: 10.1080/09669582.2020.1770770

Zarei, A., & Maleki, F. (2018). From decision to run: the moderating role of green skepticism. Journal of Food Products Marketing, 24(1), 96-116.

Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. Journal of consumer research, 37(2), 197-206.

Zheng, W., Yang, B., & McLean, G. N. (2010). Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. Journal of Business research, 63(7), 763-771.

SEISENSE Journal of Management
Vol 5 No 1 (2022): DOI: https://doi.org/10.33215/sjom.v5i1.736 , 17-30
Research Article

Job Insecurity and Turnover Intentions among Banking Sector Employees: The Moderating Role of Organizational Support and Ethical Leadership

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Article History
Received 2021-11-12
Revised 2021-12-02
Revised 20201-12-11
Accepted 2021-12-17
Published 2022-01-01

Keywords
Job insecurity
Ethical leadership
Organizational support
Turnover intentions
Banking institutions

Purpose - Job insecurity exerts a significant impact on turnover intentions among employees. The association may be partly due to the influence of organizational support and the ethicality of leaders. However, there is a shortage of studies on the ameliorating role of organizational support and ethical leadership in the nexus between job insecurity and turnover intentions. Thus, the purpose of this study is to examine the nexus between job insecurity and turnover intentions among banking sector employees. The moderating role of organizational support and ethical leadership on the underlying relationship was assessed to achieve this.

Design/methodology/approach – One hundred and sixty (160) banking sector employees were conveniently selected to participate in the study. The sample consisted of female (n = 92) and male (n = 68) employees, ranging from 23 to 49 years. Standardized measures were used in soliciting respondents' demographic characteristics, perceived job insecurity, ethical leadership, organizational support, and turnover intentions. Data were analyzed using regression analysis.

Findings – Results revealed a significant positive correlation between perceived job insecurity and turnover intentions. Organizational support and ethical leadership also moderated the association between job insecurity and turnover intentions. The influence of job insecurity on turnover intentions minimizes when management provides the needed support and favorable climatic conditions.

Originality/value – In general, the study highlights the importance of organizational support and ethical leadership in lessening the impact of job insecurity on turnover intentions.

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Introduction

Recently, the interest among researchers and employers **in** the problems of job insecurity has increased tremendously, owing to the rate of collapse of jobs and mergers and acquisitions in the Ghanaian banking sector (Okyere-Kwakye et al., 2018). This has created numerous challenges for organizations that affect the organization's effectiveness. Turnover is one of the most excellent human resource challenges an organization faces and is very destructive for organizational effectiveness (Gyensare et al., 2015). The violent nature of turnover poses a challenge for researchers in assessing the factors that ensure high retention among employees. The problem associated with setting turnover in the short term makes it prudent to evaluate the intention associated with turnover, which is a significant predictor of actual turnover. Studies have also shown that certain organizational practices and leadership determine the extent to which employees may react to insecurity surrounding the banking sector (Acha, 2012; Addai et al., 2018).

Globally, the world economy is more dynamic and has received increased interest in the banking sector (Addai et al., 2018). Each bank has to grapple with the difficulties that constantly change the decisions and projections of the bank (Acha, 2012). Considering the banking sector in Ghana, the situation is dire due to increased competition among banks, increase in the fund of stakeholders, bankruptcy, changes in management, and frequent increment in the required minimum capital (Puni et al., 2018). According to Okyere-Kwakye et al. (2018), the frequent failure of banks in Ghana has driven employees in the banking sector to seek alternative jobs, thus increasing the degree of turnover intentions (Ofori, 2020). The collapse of two local banks (UT and Capital Banks) in 2017 and the recent consolidation of five other banks (UniBank, Construction, Royal Bank, Sovereign, and BEIGE) by the Bank of Ghana has fueled the feeling of insecurity, creating a higher level of turnover intentions (Puni et al., 2018).

Turnover intention is a measurement of employees' intent to voluntarily leave their jobs or the organization's intent to remove employees from their current positions (Amponsah-Tawiah et al., 2015). According to Dwomoh and Frempong (2017), the chief determinant of turnover intentions among employees in the banking sector is the feeling of job insecurity resulting from the frequent collapse of banks. The feeling of job insecurity among employees has grown more severe and more rampant in the Ghanaian banking sector (Dwomoh, & Frempong, 2017). Economic conditions have led to a solid reconstructing initiative resulting in regular layoffs and changes in conditions of employment in the banking sector. Consolidation of Banks has also broken out in the banking sector as the new capital requirement by the central bank has pressured banks to put plans in place to acquire or merge strategic stakes in other banks (Akosah et al., 2018). The recent increase in capital requirement has triggered some mergers and acquisitions. Mergers also can make employees redundant, leading to layoffs and turnover intentions (Akosah et al., 2018).

The feeling of job insecurity leading to withdrawal responses such as turnover intentions can be influenced by managerial support and the perceived ethicality of leaders (Addai et al., 2018). Thus, managerial support and ethical leadership are essential, influential factors of job insecurity and turnover intentions. Employees perceive general beliefs about the degree to which their employers care about their welfare and support them on issues related to the job and outside the job (Osei Boakye et al., 2021; Wayne, Shore & Liden, 1997). When employees perceive a higher level of support from management, it results in feelings of obligations and greater affective attachment to the organization (Osei Boakye et al., 2021; Wayne et al., 2007). In this sense, employees disregard the insecurity surrounding the job and stick to the organization since managerial support creates a sense of importance to the organization.

Besides managerial support, ethical leadership is a significant determinant of how employees may react to insecurity surrounding the banking sector. Ethical leadership denotes "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and promoting such conduct to

followers through two-way communication, reinforcement, and decision-making" (Rubin et al., 2010, p.216). Ethical leaders demonstrate fairness, selflessness, civility, and respect for subordinates (Northouse, 2013). Ethicality in leadership generates involvement and motivates employees in organizations. According to Dinc and Nurovic (2016), the fair treatment of subordinates and the engagement in ethical principles by ethical leader's influence employees to avoid withdrawal responses associated with perceptions of job insecurity.

The proliferation of mergers and acquisitions has increased studies on turnover intentions and layoffs in Ghana. However, job insecurity as a major stressor of mergers and acquisitions and perceived layoffs has been ignored to some considerable extent by researchers in Ghana. Moreover, much of the extant research has mainly adopted the main effects approach, exploring the linkage between job insecurity and turnover intentions (Dwomoh & Frempong, 2017; Lee et al., 2017) and not concerted on various factors that can facilitate the influence of job insecurity on turnover intentions. Studies emanating from the West (Balz & Schuller, 2018; Lee & Jeong, 2017) on the sequels of job insecurity have progressed beyond the major effect relationship and have started exploring other clarifying factors. These studies have pointed out a need to explore other prevailing variables to mitigate the nexus between job insecurity and turnover intentions. However, no study has examined the influential role of ethical leadership and organizational support on the association between the underlying relationship in Ghana. Therefore, the present research fills the gap in literature relating to the burgeoning rate of insecurity associated with the banking industries.

Based on the above, this study's objectives are to:

- assess the impact of job insecurity on turnover intentions
- Establish organizational support and turnover intentions as explanatory factors moderating the correlation between job insecurity and turnover intentions.

Literature Review

Turnover Intention

Turnover, the aggregate of employees who leave a given organization in a given period, is a severe human resource concern for every organization (Alghamdi, 2018). Aside from the monetary aspect of replacing competent employees, organizations go through difficult times for their new employees to reach the level needed to achieve organizational effectiveness. Before employees quit an organization, they first conceive the intention to do so (Jimenez et al., 2017). To seek remedies for turnover, there is the need to consider turnover intentions which are the final step before employees quit the organization (Bam, 2010). Turnover intention is the wish of employees to resign from their positions (Addai et al., 2018). Turnover can be voluntary or involuntary (Lee & Jeong, 2017). Voluntary turnover intention is where the employee intentionally wants to quit his current position due to perceived injustice. This perceived injustice may include job insecurity, low salary, poor treatment from leaders, etc. Involuntary turnover deals with "the measurement of whether the organization in question plans to remove employees from their current position, causing the turnover" (Gyensare et al., 2015, p. 781). This can happen due to downsizing, mergers and acquisitions, or economic pressures. When employees perceive looming involuntary turnover, they also think of voluntarily exiting the organization (Attiah & AbouDahab, 2017). According to Lee and Jeong (2017), the voluntary turnover intention is more detrimental to the effectiveness of the organization, and thus this study assessed voluntary turnover among employees.

Job Insecurity and Turnover Intentions

The incessant layoff of employees in Ghana due to mergers and acquisitions, organizational restructuring, financial savings, and changing work practices in banking institutions to remain competitive has resulted in job

insecurity (Cascio, 1999). Accordingly, one of the major work-related stressors in the banking sector affecting the growing number of employees is perceived job insecurity (Alghamdi, 2018). Job insecurity, according to Sverke and Hellgren (2002), deals with "the overall concern about the continued existence of the job in the future" (p. 243). Exposure to job insecurity is related to varying negative employee attitudes such as turnover intention. The influence of job insecurity on turnover intentions can be explained with psychological contract theory (De Cuyper & De Witte, 2006). Psychological contracts are an individual's belief systems regarding the mutual obligation between the employee and the organization. Employees accept a position in an organization believing that the work is secured. In return for loyalty and determination, employees need to feel that their job is secured with development and career progression possibilities. When the expectations are not met, "the psychological contract is violated, and a likely result is a feeling of betrayal" (Lee & Jeong, 2017, p. 531). In this sense, employees will reciprocate by quitting the organization (turnover intentions).

Researches indicate that job insecurity may have a critical short and long-term effect on the organization. Turnover intentions that can lead to counterproductive work behaviors have short-term consequences for job insecurity. An empirical study by Alghamdi (2018) also revealed that job insecurity and turnover intentions are positively correlated among the Electricity Company of Ghana employees. Similarly, the study by Lee and Jeong (2017) found that job insecurity has a detrimental effect on turnover intentions among employees in South Korea. On the contrary, a study by Trimble (2006) found no significant connection between job insecurity and turnover intentions. According to Trimble, job insecurity is just a subjective feeling, and that the objective treatment of individual employees would determine whether employees wish to remain part of the organization over a foreseeable period or not. These inconsistent findings make it prudent for further research into the connection between job insecurity and turnover intentions. Consequently, it is predicted that:

H_1: Job insecurity significantly predicts turnover intentions

Organizational Support Moderating Job Insecurity-Turnover Intention Relationship

According to Lim (1996), perceived job insecurity connects to withdrawal response (example, turnover intentions), but the support provided by management plays a pivotal role in the underlying relationship. Balz and Schuller (2018) defined organizational support as "the degree to which employees believe that their organization values their contributions and cares about their well-being and fulfills socioemotional needs" (p. 25). Organizational support can create a felt responsibility to care among employees to assist management in achieving its objectives (Attiah & Dahab, 2017). According to the norm of reciprocity, if employees perceive support from their employers, they will emotionally commit themselves to the organization with a high possibility of job performance and a low level of turnover intentions (Balz & Schuller, 2018).

Empirically, Gunalan and Ceylan (2015) found that managerial support lessens the association between job insecurity and turnover intention. This means that the extent to which job insecurity influences turnover intentions depends on certain managerial factors such as support. More so, Jiménez et al. (2017) found that organizational support moderates the association between job insecurity and turnover intentions. Additionally, various researchers have advanced that organizational support determines the extent to which employees' perceptions about the work context influence their attitudes and behavior (Balz, & Schuller, 2018; Lim, 1996). Thus, the support employees receive for perceived job insecurity to predict turnover intentions plays a significant role. However, Bam (2010) found that organizational support does not moderate the nexus between job insecurity and turnover intentions.

Indeed, organizational support has been predicted to be an influential factor in the association between job insecurity and turnover intentions. However, empirical research is limited in literature, particularly in Ghana. This makes it prudent to conduct additional studies to examine the role of organizational support on the association between job insecurity and turnover intentions. It is, therefore, predicted that:

H_2: Organizational support moderates the relationship between job insecurity and turnover intention relationship

Ethical Leadership Moderating Job Insecurity-Turnover Intention Relationship

Ethical leadership is "the demonstration of normatively appropriate conduct through personal actions and interpersonal relationships, and promoting such conduct to followers through two-way communication, reinforcement, and decision-making" (Rubin et al., 2010, p.216). Ethical leadership possesses productive organizational characteristics such as fairness, decency, selflessness, altruism, integrity, and respect for others. A moral leader serves as a role model to employees, motivating them to engage in productive work behaviors.

Ethical leadership augments employees' perception of the organization and related issues by making employees perceive fairness and feel valued (Silla et al., 2010). Ethical leaders provide a sense of fairness and self-respect that changes employees' negative perceptions, such as insecurity in predicting employees' intention to quit. While enough studies have been done on the individual relationships between ethical leadership, job insecurity, and turnover intentions, there is a scarcity of studies on the moderating role of ethical leadership on the association between job insecurity and turnover intentions. Few studies dwell on the various principles of ethical leadership without considering ethical leadership as a unitary construct. A study by Ekmekci and Karapinar (2015) revealed that the principles of ethical leadership influenced the relation between job insecurity and turnover intentions. Similarly, Tatar and Erdil (2017) found that perceived fairness and altruism, which are core principles of ethical leadership, moderate the relation between job insecurity and turnover intentions. It is contended that if leaders hold higher levels of ethical ideals, then the negative perception of the atmosphere within the organization (perceived insecurity) will change, thus improving employees' attitudes and retention (Gyensare et al., 2015).

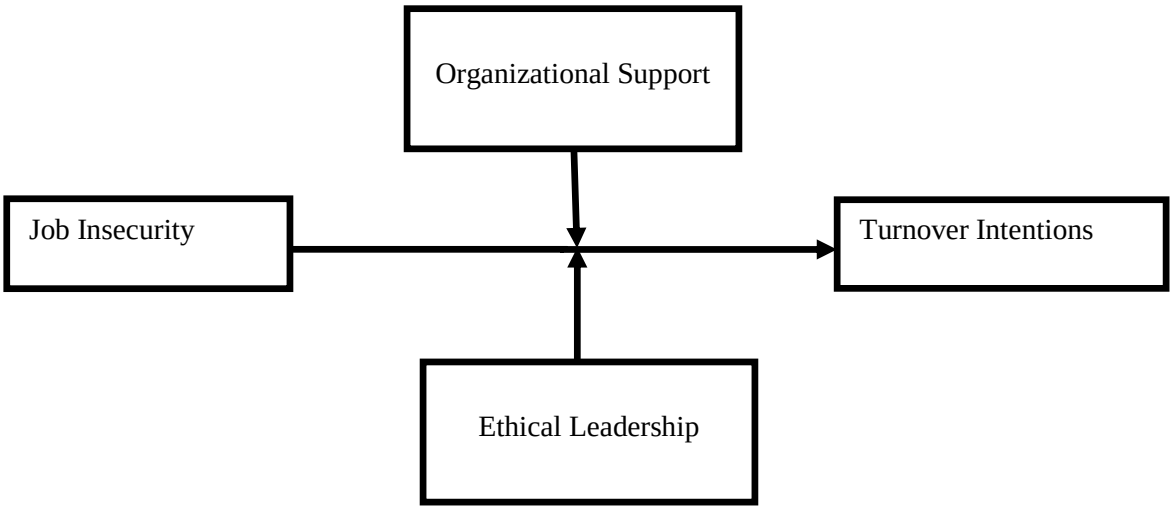

Figure 1: Hypothesized framework of organizational support and ethical leadership as moderators of the association between job insecurity and turnover intentions

In this study, ethical leadership serves as the moderator to explain the direct association between job insecurity and turnover intentions. It vies that the nexus between job insecurity and turnover intentions will be determined by the behavior and attitudes of their leaders. As depicted by Attiah and Dahab (2017), the feelings and perceptions of employees that predict their work-related attitudes and behaviors are determined by how ethical their leaders are. This means that ethical leadership can serve as an explanatory mechanism for the association between perceived job insecurity and turnover intentions. The researchers consequently predicted that ethical leadership can moderate relationship between job security and turnover intentions.

H_3: Ethical leadership moderates job insecurity and turnover intention relationship

According to psychological contract theory (Rousseau, 2011), an employee joins an organization with predetermined ideas about their responsibilities and the obligations of the employers in return. Employees who think that the employer is not fulfilling their responsibilities and duties are more likely to reduce their commitment to the organization. Inability to fulfill one's requirements naturally increases the suspicions of the other and leads to a weakening in the perceived value in the arrangement of the employment. The theory again predicts that an employee may show more negative reactions to the organization if minor interactions and support (lack of managerial support) between the individual employee and the employer. This means the negative consequences will reduce if there are higher interactions and support between the employee and the employer. Thus, the following framework can be derived from the theory.

Methodology

Research Design

This study employed a cross-sectional design. The cross-sectional design is a non-experimental method that collects data at a point in time to draw inferences about a specific population of interest (Addai et al., 2018). This design was appropriate because many data were gathered reasonably short.

Participants

Employees at Zenith and Barclays (Absa) Banks in Greater Accra participated in the study. Convenient sampling was used in deciding the participants for the study. In research work, determining the sample size is crucial due to ethical and economic reasons. It is prudent to ensure that the sample size is large enough to contribute enough research knowledge. The sample size was based on Tabachnick and Fidell (1996) formula which proposes N> 50+8(p), where p represents the number of predictions. With three (3) predictions, the sample size was projected to be more than 74. Based on this, one hundred and sixty (n=160) respondents were used. However, 160 respondents were targeted to cater to the nonresponse rate.

Measures

Job Insecurity

This was assessed with the Job Insecurity Scale (JIS, Ashfold, Lee & Bobko, 2001). The JIS is a 12-item inventory with 5-point Likert options ranging from "strongly disagree" to "strongly agree," with an alpha value of .92. Some items in the JIS include "I think that I will be able to continue working here" and "I am worried about keeping my job." Possible scores ranged from 12 – 60, with higher scores reflecting higher levels of job insecurity. The present study reported an alpha value of .89.

Organizational Support

The present study reported a Cronbach alpha of .91 for this study. It was measured with the Organisational Support Scale (OSS; Eisenberger et al., 1986) with Cronbach alpha of .87. The short version of the OSS, which is a unidimensional scale of 8 items, with 4-point Likert options ranging from "strongly disagree" to "strongly agree" was used. Sample items of the scale include: "In my organization, management identify skills we need and help to develop it," and "In my organization, management helps the employees in all issues relating to the job and outside the job". The possible maximum and minimum scores that the scale attracts are 32 and 8 respectively, with higher scores reflecting better organizational support.

Ethical Leadership

This was measured using the Multifactor Ethical Leadership Inventory (MELI) developed by Brown and Mitchel (2010). The MELI is a ten (10) item scale with a Cronbach's alpha of .84. Some items include; "My

leader conducts his/her personal life ethically" and "My leader defines success not just by results but also by how they are obtained." The MELI is responded on 5-point Likert options ranging from "strongly disagree" to "strongly agree." The scale attracts possible total scores from 0 – 50. Higher scores reflect higher ethicality in leadership.

Turnover Intentions

Data on turnover intentions was solicited using the Turnover Intention Inventory (TII) developed by Cammann et al. (1979), with a Cronbach alpha of .82. The TII is a 10-item unidimensional scale that reflects the respondent's voluntary intention to exit the organization. Sample items included "It is likely that I will actively look for a new job in the next year" and "It would take very little change in my present circumstances to cause me to leave this organization." Responses of the scale are on a 5-point Likert ranging from "strongly disagree" to "strongly agree." Higher scores on the scale reflected a higher intention to exit. The current study found a Cronbach alpha of .88 for the TII.

Procedure

Data was collected in the presence of the authors using a physical survey. Introductory letters were presented to the selected banking institutions to inform them about the possibility of using their employees for the study. With approval from the management, employees were pre-informed about the purpose, and their voluntary consent was sought to participate in the study. Respondents who consented to the study were assured of confidentiality and anonymity. The scales were then administered to the respondents in an envelope. It took approximately 30 working days to gather the data.

Results

Demographic characteristics of the respondents

Of the 160 employees who took part in the study, the majority (57%) of them were females. The respondent's age range was between 23 and 49 years, with an average of 32.60 years. Most of the respondents (66.3%) had at least a first degree in educational background. Most (61.3%) of the respondents were also married (see Table 1).

Table 1: Demographic Distribution of Respondents (n=160)

Demographics	Frequency (F)	Percentage (%)
Gender		
Male	68	42.6
Females	92	57.4
Age		
Below 25 Years	25	15.6
25 – 30 Years	39	24.4
31 – 40 Years	56	35.0
Above 40 Years	40	25.0
Educational		
Up To Senior High School	15	9.3
Diploma	39	24.4
Degree	82	51.3
Postgraduate	24	15.0
Marital Status		
Married	98	61.3
Single	62	38.7

Work Experience		
At least 5 years	32	20.0
6 – 9 years	44	27.5
10 – 15 years	49	30.6
Above 15 years	35	21.9

Descriptive Statistics

Table 2: Inter-correlation among Variables (n=160)

Variable	1	2	3	4	5	6
1. Age	-					
2. Tenure	-.03	-	.			
3. Insecurity	-.10	.15	(.86)			
4. Support	-.04	-.12	-.24**	(.92)		
5. Ethical Leadership	-.02	-.10	-.33**	.28**	(.85)	
6. Turnover	-.05	.29**	.43**	-.41**	-.32**	(.88)

From Table 2, it can be observed that job insecurity correlated negatively with organizational support (r=-.24, p <.01) and ethical leadership (r=-.33, p <.01) but positively associated with turnover intentions (r=.43, p <.01). Organizational support was also associated positively with ethical leadership (r=.28, p <.01) but negatively with turnover intentions (r=.41, p <.01). Ethical leadership correlated negatively with turnover intentions (r=-.32, p<.01).

Hypotheses Testing

Hypothesis 1: Job insecurity will significantly predict turnover intentions. The simple regression was used in analyzing this hypothesis (see Table 3). As displayed in Table 3, job insecurity significantly and positively predicted turnover intentions (β = .426, p < .001). Perceived job insecurity accounted for 18.2% of the total difference in expounding turnover intentions (R^2 = .182, $F_{(1, 159)}$ = 26.183, p < .001). This supports the first prediction.

Table 3: Simple Regression of Job Insecurity Predicting Turnover Intentions

Model	B	Std. Error	R^2	F	β
(Constant)	3.659	7.724			
Job Insecurity	0.437	0.085	0.183	26.183	0.426**

**p<0.01

Hypotheses 2 and 3 respectively proposed that "Organizational support moderates the relationship between job insecurity and turnover intention relationship" and "ethical leadership moderates the relationship between job insecurity and turnover intention relationship." The hierarchical regression model for testing the moderating effect Baron and Kenney (1986) proposed was used to analyze these two hypotheses. The predictor (job insecurity) was entered in this model in the first step. In contrast, the moderator (Organizational support or ethical leadership) was entered in the second step to forecast the outcome variable (turnover intentions). The interaction between the predictor and the moderator (job insecurity and Organizational support) (job insecurity and ethical leadership) was entered in the last step. The results for the hierarchical regression model are offered in Tables 4 and 5.

Table 4: Hierarchical Regression showing Organizational support as a moderator of the association between Job Insecurity and Turnover Intentions

Steps	β	t	R^2	ΔR^2	F	*p*
Step 1						
Job Insecurity	.426	5.117	.182	.182	26.183	.000
Step 2						
Org Support	-.326	-4.030	.281	.099	22.904	.000
Step 3						
Job Insecurity × Org Support	-.525	-2.864	.329	.048	18.943	.005

Source: Research Data, 2020

At Step 1 of Table 4, job insecurity significantly predicted turnover intentions (β = .426, $p < .01$), explaining 18.2% of the observed variance ($R^2 = .182$, $p < .01$) in turnover intentions. When organizational support was entered at Step 2, it significantly predicted turnover intentions (β = -.326, $p < .01$) accounting for an additional 9.9% of the elucidated variance in turnover intentions ($R^2 = .099$, $p < .01$). The interaction (step 3) of job insecurity and Organizational support had a significantly effect on turnover intentions (β = .525, $p < .01$) adding 4.8% of the expounded variance ($R^2 = .048$, $p < .01$). This means that, the correlation between job insecurity and turnover intentions was moderated by organizational support. The second prediction which assumed that "organizational support moderates the relationship between job insecurity and turnover intention relationship" was supported.

Table 5: Hierarchical Regression showing Ethical Leadership as a moderator of the link between Job Insecurity and Turnover Intentions

Steps	β	t	R^2	ΔR^2	F	*p*
Step 1						
Job Insecurity	.426	5.117	.182	.182	26.183	.000
Step 2						
Ethical Leadership	-.207	-2.393	.220	.038	16.478	.018
Step 3						
Job Insecurity × Ethical Leadership	.511	3.170	.282	.062	15.186	.002

Source: Research Data, 2020

From the Step 1 of Table 5, job insecurity positively predicted turnover intentions (β = .426, $p < .01$), explaining 18.2% of the observed turnover intention variance ($R^2 = .182$, $p < .01$). When entered in Step 2 of the model, ethical leadership significantly predicted turnover intentions (β = -.207, $p < .05$) adding further 3.8% of the elucidating variance in turnover intentions ($R^2 = .038$, $p < .05$). In step 3, the interaction between job insecurity and ethical leadership significantly predicted turnover intentions (β = .511, $p < .01$) accounting for an additional 6.2% of the expounded variance ($R^2 = .062$, $p < .01$). This means that, the job insecurity-turnover intentions relationship was moderated by ethical leadership. The third prediction which assumed that "ethical leadership moderates the job insecurity and turnover intention relationship" was supported.

Discussion

The study aims to accomplish two objectives: To assess the relation between job insecurity and turnover intentions and to assess ethical leadership and organizational support as factors moderating the direct link between job insecurity and turnover intentions.

The link between Job Insecurity and Turnover Intentions

The first hypothesis associated with the first objective, which proposed that job insecurity significantly predicts turnover intentions, was supported. This means that employees are more likely to decide to quit the organization when they perceive that their place in the organization is not secured. Thus, job insecurity is an essential element that fosters employee turnover intentions. The results corroborate the findings of other researches, which revealed that ethical leadership positively relates to employee commitment (Amponsah, 2015; Den Hartog & De Hoogh, 2009; Lee & Jeong, 2017). One reason for this association is that employees who perceive higher turnover intentions decide to leave because they do not want to be laid off. They, therefore, need to look for means of escaping the disgrace and psychological torture associated with being laid off (Lee & Jeong, 2017).

Moreover, job insecurity is a subjective construct. Subjectivity comes from insecurity surrounding the security of the job in the future since insecure employees do not know if they will remain with the organization or lose their jobs. Due to this, they seek employment elsewhere or plan for their future within their current organization. This has the propensity to increase turnover intentions among employees. As indicated by Zhao et al. (2007), "to keep pace with the changing environment and cut down with the cost of higher turnover rate, organizations need to be flexible and improve insecurity surrounding the job environment to be able to sustain competitive advantage and ensure profitability in the long-run" (p. 12).

Organizational Support Moderating Job Insecurity and Turnover Intentions Relationship

Concerning the second objective, two hypotheses were formulated. Organizational support was first proposed to moderate the association between job insecurity and turnover intentions. This prediction was supported. This finding implies that job insecurity independently predicts turnover intentions, but the relationship is influenced by organizational support. Thus, higher social support reduces how job insecurity leads to turnover intentions. Lower organizational support will also increase the feeling of perceived insecurity leading to turnover intentions. This supports earlier researches which revealed that organizational support moderates the association between job insecurity and turnover intentions (Balz, & Schuller, 2018; Gunalan & Ceylan, 2015; Lim, 1996). This finding, however, contradicts the study by Bam (2010), which indicated that the nexus between job insecurity and turnover intention was not moderated by organizational support.

One reason that can be proffered to explain the underlying relationship is that support provided to employees by management makes employees feel part of the organization. When employees enjoy a high level of support, they conceive that their well-being is paramount to the management and that they are part of the organization's plans. In this case, insecurity will reduce, subsequently reducing the associated withdrawal behaviors such as turnover intentions. This suggests that managers need to provide high support to employees in a situation of high insecurity surrounding the job to decrease turnover intentions and the negative consequences associated with it.

Moderating Role of Ethical Leadership in the Job Insecurity - Turnover Intentions Nexus

Lastly, based on the second objective, it was also predicted that ethical leadership would moderate the association between job insecurity and turnover intentions. This prediction was also supported. This result has established that ethicality in leadership plays a central role in the association between job insecurity and turnover intentions. Thus, the association between perceived job insecurity and turnover intentions depends on how ethical the organizational leaders are. This finding corroborates existing literature that has shown the influential role of ethical leadership on the association between job insecurity and turnover intentions (Camgoz et al., 2016; Gyensare et al., 2015; Tatar & Erdil, 2017).

As proffered by Silla et al. (2010), ethical leadership augments employees' perception of the organization and related issues by making employees perceive fairness and value. The perception of fairness due to ethical leadership creates the impression that employees are secured in their positions. When leadership demonstrates ethicality in their relationship with subordinates, it influences subordinates to change their negative perceptions of the work context, reducing the associated withdrawal behavior such as turnover intentions (Gyensare et al., 2015). This finding suggests that leaders must be ethical and demonstrate productive organizational characteristics such as decency, altruism, fairness, selflessness, integrity, and respect for others to serve as role models that motivate employees to exhibit effective work behaviors.

Limitations and Suggestions for Future Research

This study has some limitations that need to be considered in future studies. One limitation is that the study was constrained to self-report measures. It did not give room for respondents to express themselves on the cause of insecurity and the reasons for the turnover. Additional studies employing open-ended questions will be beneficial. The second limitation has to do with the study's correlational nature, which makes it impossible to draw causality. Employing longitudinal data will help explain the causal relationship examined in this study.

Moreover, because the sampling method used was a non-probability sampling technique (convenience sampling), it failed to ensure that every member of the population had an equal chance of being part of the sample. Therefore, the interpretation must be made with caution. Lastly, the study restricts itself to quantitative measures that are limiting and are thus a disadvantage. Future studies can employ the mixed method, which will help provide more information on the underlying variables considered in this study. More studies on the moderating and mediating effects on the relationship between job insecurity and turnover intentions are recommended in the future.

Managerial and Practical Implication

This study offers noteworthy progressions for both stress and turnover research. Job insecurity is considered as stress associated with turnover intentions. The findings further extend the existing literature by indicating that ethical leadership and organizational support can mitigate the association between job insecurity and turnover intentions. Therefore, if organizations find it challenging to control the constant feeling of insecurity surrounding the job, the best remedy is for management to provide a higher level of support for employees.

The significant relationship between job insecurity and turnover intentions adds to the growing evidence and support for the moderating role of organizational support and ethical leadership in the underlying relationships. The finding of job insecurity predicting turnover intentions suggests that management should explicitly explain employees' job specifications and what they should expect from the organization. This would offer direction to organizations on reducing turnover intentions among employees in an organization. Moreover, leaders need to be ethical in their dealings to reduce the perception of job insecurity and prevent the relentless turnout intention among employees.

Conclusion

The study concludes that a negative correlation exists between job insecurity and turnover intentions. Also, organizational support moderated the association between job insecurity and turnover intentions. Moreover, the positive correlation between job insecurity and turnover intentions was moderated by ethical leadership. In volatile contemporary organizations, employees form the basis for almost all business dealings; therefore, increased attention is needed towards unique measures to reduce job insecurity and curtail turnover intentions. This can be done if managers are ethical in their dealing with employees and support employees in all capacities.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

References

Acha, I. A. (2012). Microfinance Banking in Nigeria: Problems and Prospects. *International Journal of Finance and Accounting, 1*(5), 106-111.

Addai, P., Kyeremeh, E., Abdulai, W. & Sarfo, J. O. (2008). Organizational Justice and Job Satisfaction as Predictors of Turnover Intentions among Teachers in the Offinso South District of Ghana. *European Journal of Contemporary Education*, *7*(2), 235-243.

Addai, P., Ofori, I. N., Wiafe-Akenten, B. & Tweneboah, D. N. (2018). Food Insecurity and Suicidal Tendencies: Comparative Study between Employed and Unemployed Graduates in the Greater Accra Region, Ghana. *Journal of Education, Society and Behavioural Science, 24(1), 1-10.*

Akosah, N. K., Lolohb, F. W., Lawson, N. & Kumah, C. (2018). Measuring Financial Stability in Ghana: A New Index-Based Approach. *Munich Personal RePEc Archive*, 1 – 17.

Alghamdi, F. (2018). Job Insecurity, Organizational Commitment, Financial Responsibility, and Turnover Intention, a Test of Three-Way Interaction. *International Business Research, 11*(6), 213 – 225.

Allen, D., & Shanock, L. (2013). Perceived organizational support and embeddedness as key mechanisms connecting socialization tactics to commitment and turnover among new employees. *Journal of Organizational Behavior, 34*(3), 11 – 23.

Amponsah, N. Y. K. (2015). *The Impact of Perceived Organizational Politics and Job Security on Turnover Intentions among Workers of the Electricity Company of Ghana*. Unpublished thesis submitted to University of Ghana, Legon, in partial fulfillment of the requirement for the award of MPhil psychology degree.

Amponsah-Tawiah, K., Annor, F. & Arthur, B. G. (2015). Linking commuting stress to job satisfaction and turnover intention: The mediating role of burnout. *Journal of Workplace Behavioral Health, 31*(2), 104-123

Ashford, P., Lee, D. & Bobko, P.R. (2001). *Cross-cultural Psychology*: Research and Applications. Cambridge: Cambridge University Press.

Attiah, N. G. & AbouDahab, A. (2017). Investigating the factors affecting employee turnover intentions in the Educational Sector. *The Business and Management Review, 8*(5), 316 – 324

Balz, A., & Schuller, K. (2018). Always looking for something better? The impact of job insecurity on turnover intentions: Do employables and irreplaceables react differently?. *Economic and Industrial Democracy, 12*, 24 – 36

Bam, L. (2010). *Job insecurity, job satisfaction, Organisational support and intention to leave of process controllers in a South African petrochemical company*. Mini-dissertation submitted as partial fulfilment of the requirements for the degree Magister Artium in Industrial Psychology at the North-West University (Vaal Triangle Campus).

Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Brown, M. E. & Mitchell, M. S. (2010). Ethical and Unethical Leadership: Exploring New Avenues for Euture Research. *Business Ethics Quarterly*, *20*(4), 583-616.

Ekmekci, O. T. & Karapinar, P. B. (2015). Job Insecurity and Turnover Intentions: Gender Differences and the Mediating Role of Work Engagement. *Sex Roles, 75,* 11 – 12.

Cammann, C., Fichman, M., Jenkins, D. & Klesh, J. (1979). *The Michigan Organizational Assessment Questionnaire*. Unpublished Manuscript, University of Michigan, Ann Arbor, MI.

Cascio, W.F. (1999). Learning from outcomes: Financial experiences of 311 firms that have downsized', In M.K. Gowing, J.D. Kraft, & J.C. Quick (Eds.), The new organizational reality: Downsizing, restructuring, and revitalization, American Psychological Association, Washington.

De Cuyper, M. & De Witte, R. (2006). The Internal Control Index: A Newly Developed Measure of Locus of Control. *Educational and Psychological Measurement,* 44, 209 – 21.

Den Hartog, D., & De Hoogh, A. H. (2008). Ethical and Despotic Leadership, Relationships with Leader's Social Responsibility: A Multi-Method Study. *The Leadership Quarterly, 19*, 297–31

Dinc, M. S. & Nurovic, E. (2016). The Impact of Ethical Leadership on Employee Attitudes in Manufacturing Companies. *Nile Journal of Business and Economics, 3,* 3-14

Dwomoh, G. & Frempong, E. (2017). Factors Influencing Employees' Retention in the Banking Industry of Ghana. *Review of Public Administration and Management, 5*(3), 1 – 7

Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P. D. & Rhoades, L. (2001). Reciprocation of perceived organizational support. *Journal of Applied Psychology, 86*(1), 42.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. 1986. Perceived organizational support. *Journal of Applied Psychology*, 71: 500 –507

Gellis, M. & Kim, P. (2004). Intention of Leaving the Organization. *Academy of Management Journal,* 35(3), 626-637

Gunalan, M. & Ceylan, A. (2015). The Mediating Effect of Organizational Support between Job Insecurity and Turnover Intention in Private Hospitals. *International Journal of Business and Management, 10*(10), 74.

Gyensare, M. A., Otoo, E. A., Asareb, J. & Twumasi, E. (2015). Antecedents and consequence of employee turnover intention: Empirical evidence from Ghana. *Management Science Letters, 5,* 781–796

Jimenez, P., Milfelner, B., Sarotar, S., & Dunkl, A. (2017). Moderating Effects between Job Insecurity and Intention to Quit in Samples of Slovene and Austrian Workers. *Naše gospodarstvo/Our Economy*, 63(1), 27–37.

Lee, S. H. & Jeong, D. Y. (2017). Job insecurity and turnover intention: Organizational commitment as mediator. *Social Behavior and Personality: an international journal, 45*(4), 529-536

Lim, V. K. G. (1996). Job Insecurity and Its Outcomes: Moderating Effects of Work-Based and Nonwork-Based Organisational support. *Human Relations 49*(2), 171-194

Northouse, P. (2013). *Leadership Theory and Practice (6th Ed.)*. Thousand Oaks: CA, SAGE Publications, Inc.

Ofori, E. (2020). The effects of Ponzi schemes and revocation of licences of some financial institutions on financial threat in Ghana. *Journal of Financial Crime. 12*, 14 – 24.

Okyere-Kwakye, E., Nor, K. M., Assampong, I. E.-, & Awang, S. R. (2018). Employees' Turnover: Examining its Causes in the Ghanaian Banking Industry. *International Journal of Academic Research in Business and Social Sciences, 8*(2), 349–362.

Osei Boakye, A., Dei Mensah, R., Bartrop-Sackey, M., & Muah, P. (2021). Juggling between work, studies and motherhood: The role of social support systems for the attainment of work–life balance. *SA Journal of Human Resource Management, 19*, 10 pages.

Puni, A., Mohammed, I., & Asamoah, E. (2018). Transformational leadership and job satisfaction: the moderating effect of contingent reward. *Leadership and Organization Development Journal*, *39*(4), 522–537

Rousseau, D. M. (2009). Psychological Contract Inventory Technical Report. Pittsburgh, PA: Heinz School of Public Policy, Carnegie Mellon University.

Rousseau, D. M. (2011). The individual-organisation relationship: The employee trust. In S. Zedeck (ed.), *Handbook of industrial and organisational psychology* (Vol. 3, pp. 191–220). Washington, DC: American Psychological Association.

Rubin, R., Dierdoff, E., & Brown, M. (2010). Do Ethical Leaders Get Ahead? Exploring Ethical Leadership and promotability. *Business Ethics Quarterly, 20* (2), 215-236.

Shore, L. M., & Wayne, S. J. (1993). Commitment and employee behavior: Comparison of affective commitment and continuance commitment with perceived organizational support. *Journal of Applied Psychology, 78,* 774–780.

Silla, I., Gracia, J. F., Rodriguez, M. A. & Peiro, J. M. (2010). Job insecurity and employees' attitudes: The moderating role of fairness. *International Journal of Manpower, 4,* 449-465

Sverke, M., & Hellgren, J. (2002). The nature of job insecurity: Understanding employment uncertainty on the brink of a new millennium. *Applied Psychology: An International Review, 51*, 23–42.

Tabachnick, B. G. & Fidell, L. S (1996). *Multivariate analysis (3rd edition).* HarperCollins College Publishers (New York, NY)

Tatar, B. & Erdil, O. (2017). *Delineating the impact of organizational dissent on job insecurity and turnover intention Conference*: 7th International Conference on Leadership, Technology, Innovation, and Business Management

Trimble, D. E. (2006). Organizational commitment, job satisfaction, and turnover intention of missionaries. *Journal of Psychology and Theology*, 34, 349-360.

Wayne, S. J., Shore, L. M., & Liden, R. C. (1997). Perceived organizational support and leader-member exchange: A social exchange perspective. *Academy of Management Journal, 40*(1), 82–111.

Zhao, H., Wayne, S., Glibkowski, B. C., & Bravo, J. (2007). The Impact of Psychological Contract Breach on Work-Related Outcomes: A Meta-Analysis. *Personnel Psychology,* 60(3), 647-680

SEISENSE Journal of Management
Vol 5 No 1 (2022): DOI: https://doi.org/10.33215/sjom.v5i1.733 , 31-48
Research Article

On Exports and Economic Growth: Revisiting Export-Led Growth Hypothesis Including North-South Divide

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Article History
Received 2021-11-06
Revised 2022-01-05
Accepted 2022-01-10
Published 2022-01-13

Keywords
Export-led growth
Panel cointegration
FM-OLS
DOLS

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Objective: The purpose of the present study is to revisit the export-led growth hypothesis in the wake of globalization. This will help in trade policy decisions and make it possible to standpoint whether the export promotion is a good idea to accelerate economic growth.

Design: The ELG hypothesis is examined for 107 countries through panel data analysis using cointegration and panel regression tests from 1990 to 2018. The study finds strong support for the long-run relationship between exports and gross domestic product and the export-led growth hypothesis in a two-variable regression framework.

Findings: It is evident from the long-run coefficient of dynamic ordinary least squared that a 1.0 percent increase in real exports increases the real gross domestic product by 0.53 percent. The long-run coefficient of real exports for the Global South (0.55) is found higher than that of the Global North (0.51), which indicates that in the wave of globalization, the evidence of export-led growth hypothesis is stronger for comparatively poor Global South than the richer Global North.

Practical Implications: The results indicate implications for export promotion policy in the Global South countries to accelerate economic growth and increase real gross domestic product.

Originality: The study is the first to explore the ELG hypothesis using a big pool of 107 countries, including the global north-south divide.

Introduction

In the past and even in recent years, scholars have shown great interest in testing the export-led growth (ELG) hypothesis using cross-sectional, time series, and longitudinal data for developed, developing, and underdeveloped countries (Balassa, 1978; Darrat, 1987; Emery, 1967; Giles & Williams, 2000a; 2000b; Mao, Yao & Zou, 2019; Singh, 2010; Tang & Abosedra, 2019). This paper provides insights into the ELG hypothesis, keeping some basic hypotheses in mind and using advanced statistical methods for a large panel of 107 countries of the world and having a recent time dimension from 1990 to 2018. The study is the first in itself, using such a large panel for testing the ELG hypothesis and giving additional statistical evidence for support of ELG hypothesis separately for global South and global north countries of the world. To capture the role of exports in economic growth from the late twentieth century to the present day, it is important to divide the panel of countries into the global North and South.[1] The global north-south divide splits the globe into advanced and developed north pole countries and least underdeveloped or developing south pole countries.

First, the study hypothesizes that an increase in exports of goods and services leads to an increase in the gross domestic product (GDP) for sample pooled data of 107 countries. The study hypothesizes that the ELG hypothesis for global north countries is significant because they are comparatively prosperous than their southern counterparts. One possible hypothesis is whether the ELG hypothesis is significant for global south countries, first, because this study includes a dataset from the late twentieth century, i.e., 1990, and many global south economies were from then the part of the globalized world economy (Dados & Connell, 2012). Secondly, with the collapse of the Soviet Union in 1991, globalization spread its boundaries worldwide. The establishment of the World Trade Organization (WTO) in 1995 encouraged nations to form free trade unions and increase the trade volume of goods and services and intellectual property. The success of globalization and increased international trade is visible through the increased number of members of WTO that reached 164, including China. These 164 member countries constitute 98.0 percent of the total international trade (World Trade Organization, 2021).

According to the World Development Indicators database, as far as global trade is concerned, it stood up at 27.0 percent of world GDP in 1970, which increased to 39.0 percent in 1990 and further to 59.0 percent in 2018, all because of increased international cooperation and globalization. The trend of trade GDP ratio shows that both low-income and high-income economies have high proportions of openness compared to middle-income economies. It indicates middle-income economies somehow manage economic growth without

[1] It is evident that this divide is based on level of economic development and wealth, moreover, there is also a clear geographical divide between the rich Global North and the poor Global South which provides an imaginary line called 'The Brandt line.' This divides the world into two parts as countries situated on northern and southern hemisphere. However, there are many countries in the global south which are comparatively rich than their counterpart south economies and even at par with some global north economies. Additionally, there are some exception economies which geographically lies in the Global South but are actually from the Global North. The global south consists whole of Asia, Caribbean, Central and South America, Mexico, Africa and Middle East except Japan, Hong Kong, Macao, Singapore, South Korea and Taiwan from Asia, and Israel from Middle East. Australia and the New Zealand being in southern hemisphere comes in global north.

opening their economies to a much extent for trade, particularly for upper-middle-income economies (see Figure 1).

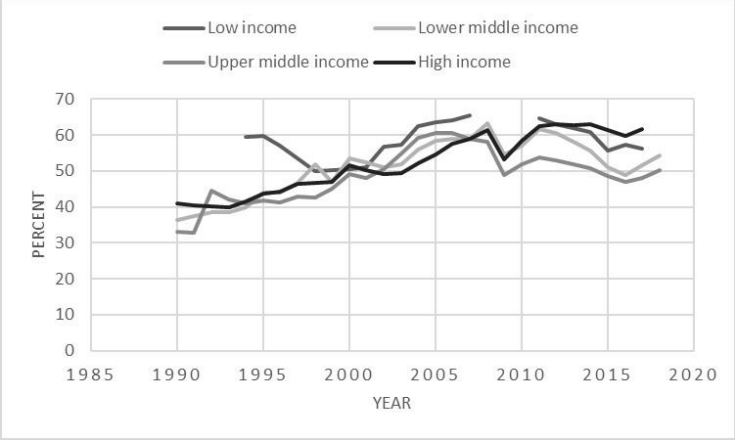

***Figure 1**: Trend of trade GDP ratio for different income economies (1990-2018)*

***Source:** World Development Indicator, World Bank Group*

Opening the economy for trade is not enough for economic growth. A country should have a competitive production surplus to export (Leff, 1969), and this benefit from trade can be seen through export GDP ratios of different economies. As far as the world economy is concerned, the export GDP ratio stood up at 13.0 percent in 1970, increasing to 19.0 percent and 30.0 percent in 1990 and 2018, respectively. Export GDP ratio shows a similar trend to trade GDP ratio. The export GDP ratio for high-income economies is high compared to low-income and middle-income economies. The export GDP ratio is the least for low-income economies throughout the last two decades. Low-income economies may be susceptible to trade disadvantages as these economies have a comparatively high trade GDP ratio but a meager export GDP ratio (see Figure 2). However, the annual growth rate of exports shows a positive and upward trend for lower-middle-income economies and a downward trend for high-income economies (see Figure 3).

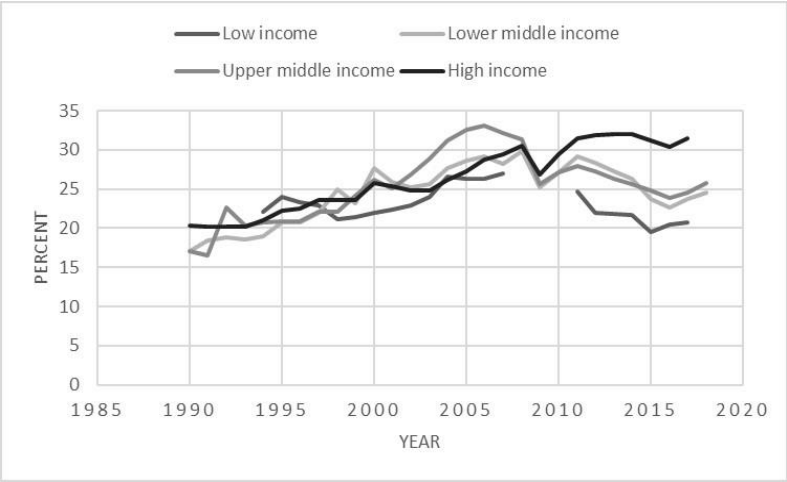

***Figure 2**: Trend of export GDP ratio for different income economies (1990-2018)*

***Source:** World Development Indicator, World Bank Group*

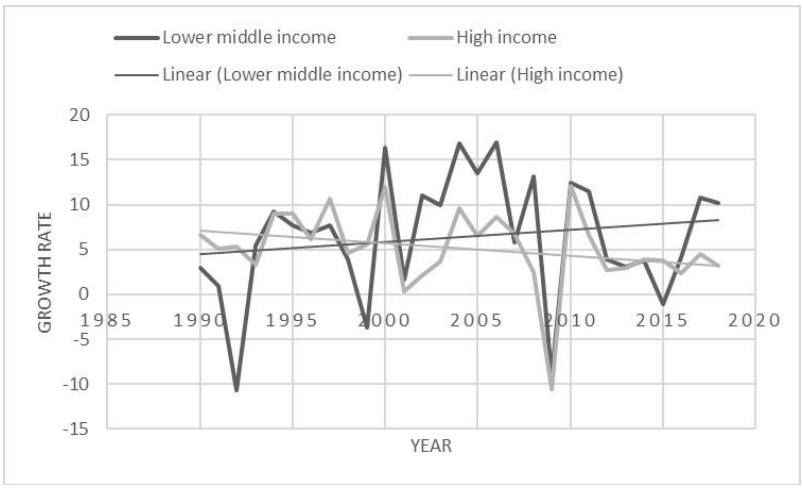

***Figure 3**: Trend of annual export growth rates (%) for different income economies (1990-2018)*

***Source:** Based on Author's calculation using World Development Indicator, World Bank Group*

For the period 1990 to 2018, the United States of America (USA) had the highest mean GDP and mean exports in study sample of 107 nations. While Japan had the second largest mean GDP during the time, its mean exports were lower than economies such as Germany and China. With the exception of a few advanced economies such as Japan and the United States, developing economies such as Brazil, and low-income economies on the African continent, the majority of economies, including France, the United Kingdom (U.K.), Italy, Canada, and the Netherlands, are inclined to a high proportion of exports in GDP (see Figure 4). As level variables are transformed to natural logs, the distribution shows that most economies are on a 45-degree line of equality, with an equal proportionate change in GDP and exports (see Figure 5).

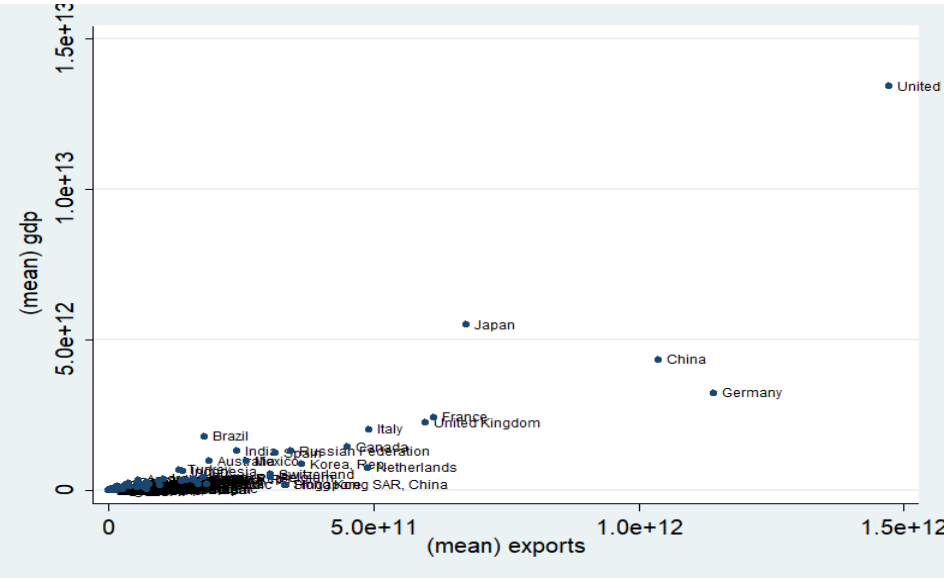

***Figure 4**: Scatterplot of mean (GDP) and mean (Exports)*

***Source:** Based on Author's calculation using World Development Indicator, World Bank Group*

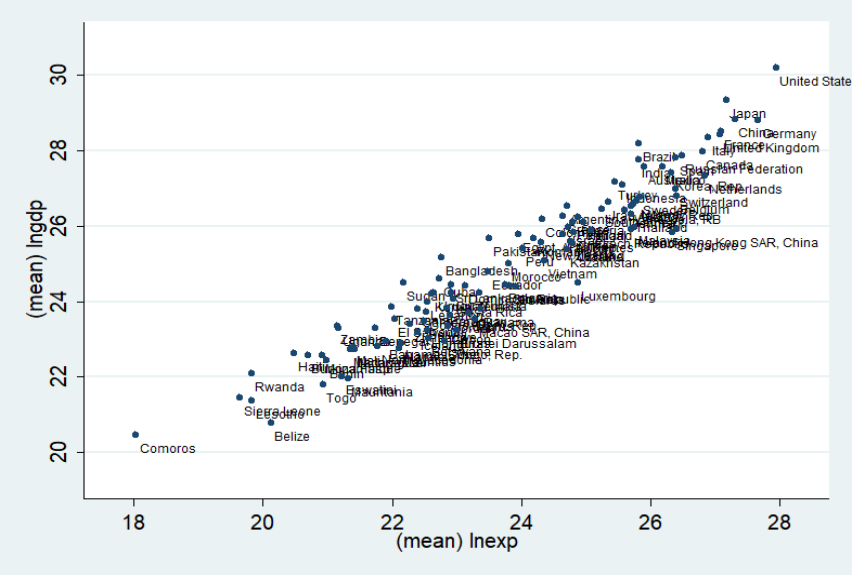

***Figure 5**: Scatterplot of mean (ln GDP) and mean (ln Exports)*

***Source:** Based on Author's calculation using World Development Indicator, World Bank Group*

The scatter plot on the mean log of GDP and mean log of exports for Global South is much more uniform than the scatter plot of Global North (see Figures 6 and 7). The plot for Global South is very similar to the pooled data plot discussed earlier (see Figure 5). In Global North, economies like Germany, Netherland, Switzerland, Belgium, Hong Kong, Singapore, Luxembourg, Macao are more open than other countries of Global North, and these economies are much more export-oriented than others. This primary analysis shows a need to capture the ELG hypothesis from the global north-south point of view so that the role of exports in economic growth can be re-examined in the present scenario of a more globalized world and comparatively poor Global South.

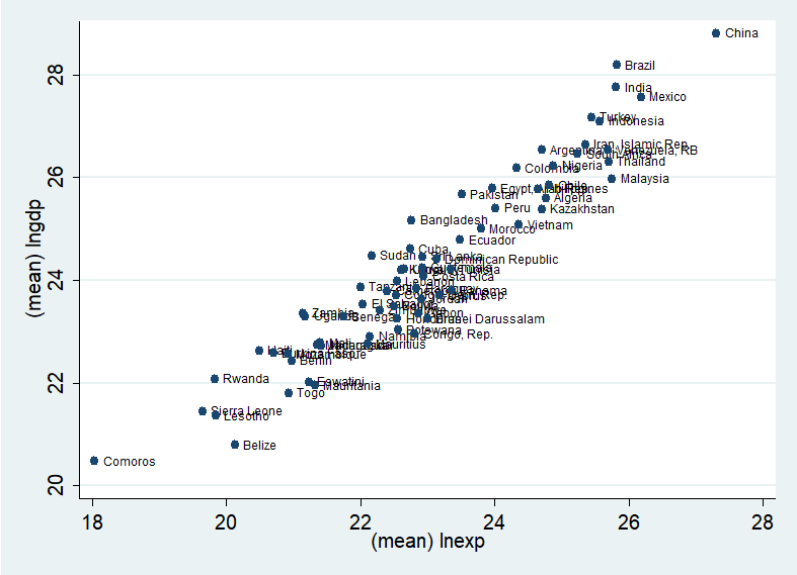

***Figure 6**: Scatterplot of the mean (ln GDP) and mean (ln Exports) for Global South*

***Source:** Based on Author's calculation using World Development Indicator, World Bank Group*

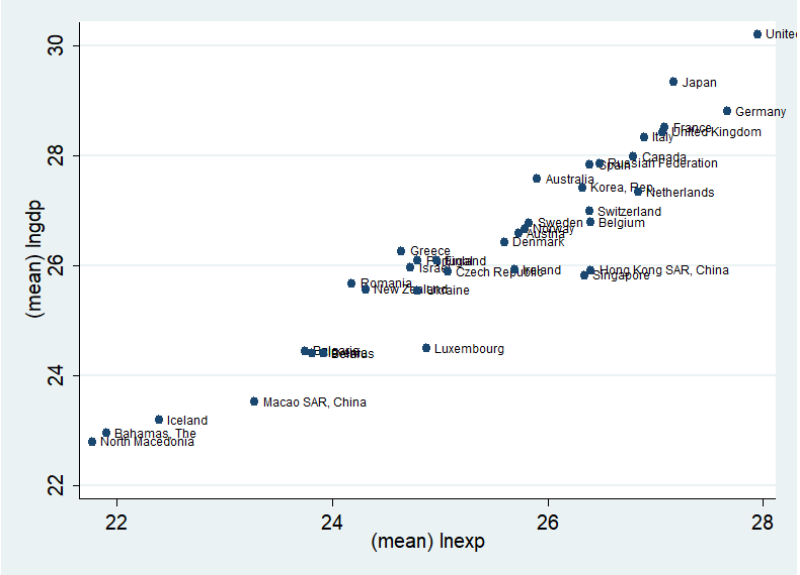

***Figure 7**: Scatterplot of the mean (ln GDP) and mean (lnExports) for Global North*

***Source:** Based on Author's calculation using World Development Indicator, World Bank Group*

Literature Review

ELG Hypothesis Revisited

Earlier works have explained the role of exports in economic growth by counting the advantages of export promotion policies. First, exports are not only part of the production function, but it creates positive externalities by creating working opportunities in domestic industries/markets (Abosedra & Tang, 2019); second, it brings new technologies and skills by increased international cooperation (Grossman & Helpman, 1991), third, open trade policies not only help in economic growth but also enable to reduce poverty, improve productivity and innovate (World Bank, 2018), fourth, increased international collaboration and identifying export activities as part of country's economic agenda helps in creating jobs and economic growth (Katz & Istrate, 2011) and most importantly, export-oriented industrialization which has been stabilized in studies like Keesing (1967), Krueger (1975), Bhagwati (1982), Srinivasan (1985), Chow (1987).

Many studies have found strong evidence of export-led growth, including Emery (1967), Severn (1968), Balassa (1978), Feder (1983), Heitger (1987), Ram (1987), Fosu (1990), Sengupta (1991), Khan and Saqib (1993), Lussier (1993), Lee and Cole (1994), Van den Berg and Schmidt (1994), Begum and Shamsuddin (1998), Giles and Williams (2000a; 2000b), Love and Chandra (2005), Furuoka (2007), Dash (2009), Singh (2010), He and Zhang (2010), Tiwari (2011), Hye, Wizarat and Lau (2013), Ee (2016), Tang and Tan (2015), Ahmad, Draz and Yang (2018), Ali and Li (2018), Mao et al. (2019), Tang and Abosedra (2019), Felipe and Lanzafame (2020). Here, a study from China supported ELG by examining the causality between exports and total factor productivity. The study found growth is mainly supported by the supply-side perspective increasing the economy's production capacity (He & Zhang, 2010). Another study (Ee, 2016) found support for ELG for Sub-Saharan African countries from 1985 to 2014. It opined a long-run relationship between exports and growth using panel regression with significant regressors like investment and government expenditure. Mao et al. (2019) found that the faster growth productivity in the export sector led to higher economic growth under a fixed exchange rate regime. Tang and Abosedra (2019) took a sample of 21 Asian economies and found ELG valid from 2010 to 2016. Logistics sector performance was found to affect export growth and economic growth significantly.

Recently, Felipe and Lanzafame (2020) showed that China's growth trajectory, since the early 1980s, has been associated with the consistent and significant growth of its exports.

However, studies like Syron and Walsh (1968), Maizels (1968), and Kravis (1970) found the nature of exports as a determining factor of whether an economy will be benefited from export growth or not. The results revealed that export diversification, particularly to manufactured goods, helps stimulate economic growth through increased productivity in the domestic sectors of less developed countries. According to Syron and Walsh (1968), growth in exports positively affected real gross national product (GNP) per capita, but the commodity of exports decided the magnitude of benefit as evidence of the differing impact of exports on least and most developed economies were visible. It is found that the relationship between trade and growth cannot be generalized. External demand for exports and internal factors strengthen the growth path (Kravis, 1970).

Additionally, studies like Michaely (1977), Tyler (1981), Kavoussi (1984), Balassa (1985), Ram (1985), Moschos (1989) supported the ELG hypothesis conditioning an income threshold and indicating that counties that reach a minimum level of national income get more benefits from export growth. Like Michaely (1977) found, export growth is positively associated with economic growth for more developed economies and not at all for least developed ones. Kavoussi (1984) explained that export expansion is positively associated with economic growth by positively influencing total factor productivity for developing nations, and gains persist with the shift from primary to manufactured goods as the country's income increases. Similarly, Balassa (1985) found that outward-oriented trade policy with product diversification towards manufactured goods positively affects the growth performance of developing economies. Ram (1985) opined export performance affects economic growth, and this association gets more robust in times of strain on the balance of payment.

There is considerable literature available which either weakly support the ELG hypothesis or reject it significantly, and among these, some important studies are like Heller and Porter (1978), Jung and Marshall (1985), Darrat (1987), Colombatto (1990), Kugler (1991), Afxentiou and Serletis (1991), Serletis (1992), Sheehey (1993), Greenaway and Sapsford (1994), Jin (1995), Henriques and Sadorsky (1996), Al-Yousif (1997), Islam (1998), Shan and Sun (1998), Dhawan and Biswal (1999), Sharma and Panagiotidis (2005). Among these, Heller and Porter (1978) found export-led growth visible for only some comparatively rich economies with low export shares of output. Jung and Marshall (1985) found that only 4 out of 37 developing nations showed exports causing economic growth, and, in many cases, exports reducing growth has been found.

Darrat (1987) examined a sample of the then four newly industrialized countries (NIC) of Asia and found causality from export growth to economic growth rejected for 3 out of 4 economies. However, a positive association was found between exports and economic growth. Kugler (1991) examined six industrialized economies to test ELG and found only 2 (France and West Germany) out of 6 countries (including the USA) showed a long-run relationship between exports and GDP. Studies like Afxentiou and Serletis (1991) for 16 industrialized countries, Serletis (1992) for Canada, Sheehey (1993) for 65 semi-industrialized countries, Greenaway and Sapsford (1994), Jin (1995) for four little tigers of Asia, Henriques and Sadorsky (1996) for Canada, Al-Yousif (1997) for four Arab Gulf nations, Islam (1998) for 15 NICs of Asia, Shan and Sun (1998) for China, Dhawan, and Biswal (1999), Sharma and Panagiotidis (2005) for India showed only short-run or bidirectional causality between exports and economic growth which makes ELG hypothesis weaker. Tang, Lai, and Ozturk (2015) and Abosedra and Tang (2019) have also found the ELG hypothesis unstable.

These studies reviewed so far have used cross-section, time series, and longitudinal data and cover almost all world economies. It can be inferred from earlier works that, in general, the ELG hypothesis is somewhat weak, if not rejected, for low-income or less developed economies, and there also exists a threshold income for export-led growth. In the 1960s and 1970s, most studies used two variable frameworks and simple regression correlation techniques to test the ELG hypothesis. Still, later studies used multivariate frameworks including

domestic and foreign investment, labor force, foreign exchange reserves, the balance of payment (BoP), and other variables and used advanced econometric techniques like cointegration, causality tests, etc.

The study found some relevant dimensions to extend the earlier works. First, this study covers a pool of all relevant nations adding up to 107 countries of the world and years from 1990 to 2018 (the latest available data). As no other study has used such a big pool of countries earlier, it would be giving new insights on ELG. Second, the period for the study is being selected in the wake of globalization to capture the relevance of the ELG hypothesis in the present scenario. The findings will help in trade policy decisions and make it possible to standpoint whether the export promotion is a good idea to accelerate economic growth. Third, as earlier literature points out towards a threshold income effect of exports on economic growth, this study divides the sample of 107 countries into two parts, i.e., the Global North (comparatively rich) and the Global South (comparatively poor). This will help both developed and developing nations formulate future trade policy decisions when international cooperation increases rapidly. Fourth, the study employs the latest available panel econometric techniques to test ELG hypotheses such as panel unit root tests followed by panel cointegration tests and, finally, practical panel regression tests.

Data and Methodology

The data for the study has been drawn from World Development Indicators (WDI) of the World Bank Group. This paper is based on panel data of the world's major 107 countries (see appendix) to analyze the export-led growth hypothesis (ELGH) from 1990 to 2018. The data on the real gross domestic product (real GDP) and real exports of goods and services are in constant of 2010 US dollar. Further to test ELGH for global South and global north countries, two separate pooled panel analyses have been carried out with the same dimensions. A total of 3103 observations has been analyzed at the world level for 107 countries, while 2030 observations (70 countries) are from the global South and 1073 observation (37 countires) are from the global North. The study uses a simple two-variable regression framework as follows;

$$real\ GDP = f(real\ exports) \tag{1}$$

Panel Unit Root Tests

Panel unit root tests are preconditions for panel co-integration tests. The study employs both the first- and second-generation panel unit root tests to avoid misleading results and report statistics based on constant (intercept) only and constant and trend. The panel unit root test and statistic can be drawn from the following regression model;

$$\mathcal{Y}_{it} = \rho \mathcal{Y}_{i,t-1} + \mathcal{Z}'_{it}\mathcal{Y}_i + \varepsilon_{it} \tag{2}$$

Where i = 1, …, N indexes panel; t = 1, …, Ti indexes time; $\mathcal{Y}_{it}$ is the variable being tested for unit root and ε_{it} is the white noise error term. The term $\mathcal{Z}'_{it}\mathcal{Y}_i$ allows for panel specific means or means and trends or nothing based on the value of $\mathcal{Z}'_{it}$. Panel unit root tests use the null hypothesis of H_0: $\rho_i = 1$ for all i against the alternative of H_1: $\rho_i < 1$. Cross-sectional means have been removed before testing unit root tests.

First, the unit root test developed by Harris-Tzavalis (1999) has been used, which assumes a fixed T or time dimension and a greater N or number of panels. It assumes a common autoregressive parameter for all panels or cross-sectional independence, which is a weakness of first-generation panel unit root tests like the HT test.

Second, for this purpose, one of the second-generation tests of panel unit root, i.e., the Im-Pesaran-Shin (2003) test, has been used. It relaxes the assumption of cross-sectional independence and allows for more precision in defining the stationarity of the variable. It uses a set of Dickey-Fuller regressions where errors may have heterogenous variances across panels. Similarly, the ADF fisher type unit root test has also been used, which

performs a separate unit root ADF test on each panel and combines each p-value generated in the process to obtain an overall statistic for the panel unit root test. Here, the study has used the inverse normal Z statistic, which offers the best result suggested by Choi (2001).

Panel Co-Integration Tests

The study uses panel co-integration tests if all the variables used in the model are stationary at first difference. If panels are stationary at levels, then a simple pooled, fixed, or random effect model can be applied. For this purpose, the study uses two different panel co-integration tests suggested by Pedroni (1999, 2004) and Westerlund (2005) to confirm the long-run relationship between exports and GDP. Both the tests have a null hypothesis of no co-integration. Both the constant only and constant and trend estimations of co-integration are reported for precise results. The panel co-integration tests are based on the following regression;

$$y_{it} = x'_{it}\beta_i + z'_{it}y_i + \varepsilon_{it} \quad (3)$$

Here x'_{it} are covariates and β_i denotes the cointegrating vector. In panel co-integration, it is to test whether ε_{it} is non-stationary or not. The residuals are estimated using Eq. (3), and to get DF t, DF regression is fitted as follows;

$$\hat{\varepsilon}_{it} = \rho\hat{\varepsilon}_{i,t-1} + v_{it} \quad (4)$$

Where ρ is the panel-specific autoregressive term and test whether the coefficient ρ is 1. The equation for the PP t-test is as follows;

$$\hat{\varepsilon}_{it} = \rho_i\hat{\varepsilon}_{i,t-1} + v_{it} \quad (5)$$

The PP t-test tests whether ρ_is are 1 or not.

The augmented Dickey-Fuller (ADF) t is computed using the following regression, which uses additional lags;

$$\hat{\varepsilon}_{it} = \rho_i\hat{\varepsilon}_{i,t-1} + \sum_{j=1}^{p}\rho_{ij}\,\Delta\,\hat{\varepsilon}_{i,t-j} + v^*_{it} \quad (6)$$

Where $\Delta\,\hat{\varepsilon}_{i,t-j}$ is the jth lag of the first difference of $\hat{\varepsilon}_{it}$ and j = 1,…, p, where p is the number of lag differences.

The test suggested by Pedroni (1999, 2004) produces two types of statistics, i.e., within (panel) and between (group). The study computes PP and ADF t statistics for each type of test. The Pedroni test is somewhat better than Kao (1999) as it considers heterogeneity in using panel-specific parameters. On the other hand, Westerlund (2005) suggested a panel co-integration test based on variance ratio (VR). The test statistics are computed using the ratio of variances of the predicted residuals of Eq. (3). The test computes four different statistics, of which two are based on cross-sectional units, and two are based on the panel as a whole.

Co-Integration Estimations

The panel co-integration tests only indicate the presence of a long-run relationship between regressand and regressors. Still, it cannot estimate the exact long-run relationship and its direction. For this purpose, fully modified OLS (FM-OLS) and dynamic OLS (DOLS) can be used to estimate single equation estimators for a long-run relationship between cointegrated variables.

As evident from the study of Kao and Chiang (2001), the OLS and FM-OLS estimates are not consistent for a homogenous and heterogenous panel, while DOLS perform better than OLS and FM-OLS in all cases of

homogenous and heterogenous panels by adding optimal leads and lags to the regression. This reduces the bias of the DOLS estimates.

Empirical Findings

Panel Unit Root Results

To begin with panel data analysis testing ELGH and capturing the long-run relationship between GDP and exports for a panel of 107 countries, the study first employs Harris-Tzavalis (1999) panel unit root test on natural logs of variables which confirms that both real GDP and real exports have a unit root at levels for the study period. The results of unit root at levels are consistent for both constant (intercept) and constant and trend regressions. However, all of them become stationary at first difference.

The unit root test results for the global South and global north are consistent with the results of the pooled panel, and variables are I (1) for each series. The results of the panel unit root test suggested by Im et al. (2003) and ADF Fisher type are consistent with the results of Harris-Tzavalis (1999) (see table 1) and confirm that both real GDP and real exports are integrated of order one or I (1).

Table 1- Unit root tests

Variables (Natural log)	*Harris-Tzavalis (z value)*		*Im-Pesaran-Shin (t-bar$_{NT}$)*		*ADF-Fisher (inverse normal Z)*	
	Levels	I (1)	Levels	I (1)	Levels	I (1)
Constant						
Pooled data (Countries = 107, T = 29)						
GDP per capita	4.533	-59.799***	-0.474	-4.033***	8.672	-22.261***
Exports	2.288	-81.125***	-1.346	-4.783***	1.224	-26.655***
Global South (Countries = 70)						
GDP per capita	2.727	-55.960***	-0.219	-4.197***	9.130	-17.583***
Exports	2.1840	-68.016***	-1.307	-4.812***	1.571	-20.617***
Global north (Countries = 37)						
GDP per capita	2.136	-21.696***	-0.956	-3.724***	2.211	-13.671***
Exports	0.2996	-38.297***	-1.419	-4.728***	-0.079	-16.968***
Constant and trend						
Pooled data (Countries = 107, T = 29)						
GDP per capita	3.605	-24.165***	-2.125	-4.186***	-2.566**	-17.234***
Exports	0.717	-40.849***	-1.978	-5.042***	1.381	-24.084***
Global South (Countries = 70)						
GDP per capita	1.501	-25.382***	-2.178	-4.380***	-2.418**	-13.265***
Exports	0.9975	-34.739***	-1.883	-5.078***	1.394	-18.381***
Global north (Countries = 37)						
GDP per capita	2.986	-6.418***	-2.026	-3.820***	-1.039	-11.063***
Exports	-0.6881	-17.517***	-2.158	-4.973***	0.431	-15.674***

Note: ** and *** denote 0.05 and 0.01 level of significance, respectively. The optimum lag length has been chosen using AIC as 1 for the above unit root tests.

Panel Cointegration Results

As evident from unit root tests, both real GDP and real exports integrated order one. Panel cointegration tests can be applied to the equation above (see table 2). Model having real GDP as regressand and real exports as

regressor is used for cointegration test. Pedroni's cointegration test statistics indicate cointegration at the 0.01 level, which is visible for constant and trend estimations. The same is true for the global South and global north panels. The result of Pedroni's cointegration indicates a long-run relationship between the variables.

Table 2. Pedroni's panel cointegration test

$\boldsymbol{real\ GDP = f(real\ exports)}$	Constant	Constant and trend
Pooled data		
Panel PP stat	-1.352	-2.758***
Panel ADF stat	-1.06	-3.738***
Group PP stat	-7.208***	-10.3***
Group ADF stat	-9.425***	-13.72***
Global South		
Panel PP stat	-0.2129	-2.65***
Panel ADF stat	0.3101	-3.078***
Group PP stat	0.6459	-1.659*
Group ADF stat	-0.7035	-4.215***
Global North		
Panel PP stat	-2.773***	-1.716*
Panel ADF stat	-3.514***	-2.736***
Group PP stat	-2.776***	-1.1
Group ADF stat	-4.28***	-2.767***

Note: *, ** and *** denote 0.10, 0.05 and 0.01 level of significance, respectively. Optimum lag length and leads have been chosen using AIC as 2 for the above cointegration test.

The study next employs Westerlund's cointegration test to confirm the long-run relationship between real GDP and real exports for pooled data. The test results suggest that there is cointegration between real GDP and real exports for the study period for a model constant and trend. The result of cointegration tests indicates that the global north panel exhibits a clear long-run relationship which is evident from the constant and constant and trend significant estimations. However, the same is not true for the global South.

Table 3. Westerlund's ECM panel cointegration test

$\boldsymbol{real\ GDP = f(real\ exports)}$	Constant	Constant and trend
Pooled data		
Gt	0.345	-9.692***
Ga	1.786	5.961
Pt	1.782	-5.587***
Pa	-0.933	-1.848**
Global South		
Gt	3.888	-8.775***
Ga	3.684	4.340
Pt	2.465	-1.659**
Pa	0.276	0.551
Global North		
Gt	-4.761***	-4.413***
Ga	-2.029**	4.167
Pt	-3.161***	-7.149***
Pa	-5.444***	-4.116***

Note: *, ** and *** denote 0.10, 0.05 and 0.01 level of significance, respectively. Optimum lag length and leads have been chosen using AIC for the above cointegration test. z-values have been shown to test the null hypotheses of no evidence of cointegration of at least one of the cross-sectional units (Gt and Ga) and as no evidence of cointegration for the panel as a whole (Pt and Pa).

Panel Cointegration Estimations Using FM-OLS and DOLS

The presence of panel cointegration suggested by Pedroni's and Westerlund's cointegration tests leads to the estimate of FM-OLS and DOLS coefficients to know the direction and magnitude of the long-run relationship between real real real GDP and real exports. It is evident from the pooled regression coefficients that for 107 countries panel from the year 1990 to 2018, there is a long-run relationship between real GDP and real exports. The ELG hypothesis is being proved for this large panel. The positive and significant coefficients of FM-OLS and DOLS suggest a long-run linkage between real exports and growth (real GDP). According to FM-OLS and DOLS estimations, a 1.0 percent increase in real exports will increase real GDP by 0.54 percent and 0.53 percent, respectively.

Table 4. Results of Fully Modified OLS and Dynamic OLS estimations

Real GDP on Real Exports	FMOLS			DOLS		
	Coefficient	*t-value*	*R-squared*	*Coefficient*	*t-value*	*R-squared*
Pooled data	0.548201***	56.55048	0.994560	0.537967***	59.17198	0.995743
	(0.009694)			(0.009092)		
Global South	0.561662***	44.19483	0.991143	0.549100***	46.14435	0.993043
	(0.012709)			(0.011900)		
Global North	0.507626***	39.58603	0.996744	0.505313***	40.88727	0.997465
	(0.012823)			(0.012359)		

Note: *, **, and *** denote 10%, 5% and 1% level of significance, respectively. Figures in parentheses are corresponding standard errors. Automatic leads and lags specifications are based on the SIC criterion.

As evident from the long-run coefficients of the Global South and the Global North, the coefficient for Global South is higher than that of the Global North and indicates that the ELG hypothesis is stronger in the Global South comparison to the Global North. For the Global South, the long-run coefficients of FM-OLS and DOLS indicate that a 1.0 percent increase in real exports will increase the real GDP by 0.56 percent and 0.55 percent, respectively. For the Global North, the long-run coefficients of FM-OLS and DOLS are approximately the same i.e., 0.51.

Conclusion and Policy Implications

This study examined the export-led growth hypothesis for 107 countries through panel data analysis using unit root tests followed by cointegration and panel regression tests, i.e., FM-OLS and DOLS from 1990 to 2018. The empirical results indicated strong support for the long-run relationship between real exports and real GDP and the export-led growth hypothesis in these countries' two-variable regression framework. It is evident from the long-run coefficient of DOLS that a 1.0 percent increase in real exports increases the real GDP by 0.53 percent. The long-run coefficient of real exports for the Global South (0.55) is found higher than that of the Global North (0.51), which indicates that in the wave of globalization, the evidence of export-led growth hypothesis is stronger for comparatively poor Global South than the richer Global North.

For the pooled sample from 1990 to 2018, this empirical study revealed that an increase in real exports leads to real GDP. In the long run, exports have had a major and favorable impact on domestic production in the Global North and South. In terms of trade GDP and export GDP ratios, the North is more open to international trade than the South; however, the South has benefited more in the last decade of the twentieth

century due to continuous efforts to reduce trade restrictions and technological advancement (International Monetary Fund, 2001), as evidenced by the DOLS coefficients. Comparatively poor Global South countries have reaped the benefits of increased exports in the late 20th and beginning of the 21st century to increase real GDP. Increased globalization has benefitted comparatively developing countries more than rich countries. Previous research (Ee, 2016; Felipe & Lanzafame, 2020; He & Zhang, 2010; Mao et al., 2019; Tang and Abosedra, 2019) that looked at a sample from the global South provided support for this study. The results indicate implications for export promotion policy in the Global South countries to accelerate economic growth and an increase in the real gross domestic product in the present scenario.

Funding: The author received no financial support for this article's research, authorship, and/or publication.

Acknowledgments: The views expressed in this paper are those of the author and do not reflect the institution's views to which the author is affiliated. I thank my colleagues who provided insights and expertise, which greatly assisted the research. However, any errors are my own and should not tarnish the reputation of esteemed persons from respective institutions.

Conflicts of Interest: The author declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

References

Abosedra, S., & Tang, C.F. (2019). Are exports a reliable source of economic growth in MENA countries? New evidence from the rolling Granger causality method. *Empirical Economics, 56*, 831–841. https://doi.org/10.1007/s00181-017-1374-7

Afxentiou, P.C., & Serletis, A. (1991). Exports and GNP Causality in the industrial countries: 1950-1985. *Kyklos, 44*(2), 167-179. https://doi.org/10.1111/j.1467-6435.1991.tb02095.x

Ahmad, F., Draz, M.U., & Yang, S.-C. (2018). Causality nexus of exports, FDI and economic growth of the ASEAN5 economies: evidence from panel data analysis. *Journal of International Trade and Economic Development, 27*(6), 685-700. https://doi.org/10.1080/09638199.2018.1426035

Al-Yousif, Y.K. (1997). Exports and economic growth: Some empirical evidence from the Arab Gulf countries. *Applied Economics, 29*(6), 693-697. https://doi.org/10.1080/000368497326624

Ali, G., & Li, Z. (2018). Exports-led growth or growth-led exports in the case of China and Pakistan: An empirical investigation from the ARDL and Granger causality approach. *International Trade Journal, 32*(3), 294-314. https://doi.org/10.1080/08853908.2017.1379449

Balassa, B. (1978). Exports and economic growth. *Journal of Development Economics, 5*(2), 181-189. doi:10.1016/0304-3878(78)90006-8

Balassa, B. (1985). Exports, policy choices, and economic growth in developing countries after the 1973 oil shock. *Journal of Development Economics, 18*(1): 23–35. doi:10.1016/0304-387

Begum, S., & Shamsuddin, A.F. (1998). Exports and economic growth in Bangladesh. *Journal of Development Studies, 35*(1), 89-114. doi:10.1080/00220389808422556

Bhagwati, J.N. (1982). Directly Unproductive, Profit-Seeking (DUP) Activities. *Journal of Political Economy, 90*(5), 988-1002. www.jstor.org/stable/1837129

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance, 20*(2), 249-272. https://doi.org/10.1016/S0261-5606(00)00048-6

Chow, P.C. (1987). Causality between export growth and industrial development: Empirical evidence from the NICs. *Journal of Development Economics, 26*(1), 55-63. https://doi.org/10.1016/0304-3878(87)90051-4

Colombatto, E. (1990). An Analysis of Exports and Growth in LDCs. *Kyklos, 43*(4), 579-597. doi:10.1111/j.1467-6435.1990.tb02238.x

Dados, N., & Connell, R. (2012). The Global South. *Contexts, 11*(1), 12–13. doi:10.1177/1536504212436479

Darrat, A.F. (1987). Are exports an engine of growth? Another look at the evidence. *Applied Economics, 19*(2), 277–283. doi:10.1080/00036848700000102

Dash, R.K. (2009). Revisited Export-Led Growth Hypothesis: An Empirical Study on India. *South Asia Economic Journal, 10*(2), 305–324. https://doi.org/10.1177/139156140901000203

Dhawan, U., & Biswal, B. (1999). Re-examining export-led growth hypothesis: a multivariate cointegration analysis for India. *Applied Economics, 31*(4), 525-530. https://doi.org/10.1080/000368499324246

Ee, C.Y. (2016). Export-Led Growth Hypothesis: Empirical Evidence from Selected Sub-Saharan African Countries. *Procedia Economics and Finance, 35*, 232-240. https://doi.org/10.1016/S2212-5671(16)00029-0

Emery, R.F. (1967). The Relation of Exports and Economic Growth. *Kyklos, 20*(4), 470–486. doi:10.1111/j.1467-6435.1967.tb00859.x

Feder, G. (1983). On exports and economic growth. *Journal of Development Economics, 12*(1-2), 59–73. doi:10.1016/0304-3878(83)90031-7

Fosu, A.K. (1990). Exports and economic growth: The African case. *World Development, 18*(6), 831-835. doi:10.1016/0305-750x(90)90005-i

Furuoka, F. (2009). Econometric Analysis of the Export-led Growth Hypothesis: Evidence for BIMP-EAGA Countries. *Philippine Journal of Development, 34*(2), 25-42. Retrieved from https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidspjd07-2bimpeaga.pdf

Giles, J.A., & Williams, C.L. (2000a). Export-led growth: a survey of the empirical literature and some non-causality results, Part 1. *Journal of International Trade and Economic Development, 9*(3), 261-337. https://doi.org/10.1080/09638190050086177

Giles, J.A., & Williams, C.L. (2000b). Export-led growth: a survey of the empirical literature and some non-causality results, Part 2. *Journal of International Trade and Economic Development, 9*(4): 445-470. https://doi.org/10.1080/096381900750056867

Greenaway, D., & Sapsford, D. (1994). What does liberalisation do for exports and growth. *Weltwirtschaffliches Archiv, 130*(1), 152-174. Retrieved from www.jstor.org/stable/40440270

Grossman, G.M., & Helpman, E. (1991). *Innovation and growth in the global economy*. Cambridge: MIT Press. Retrieved from https://mitpress.mit.edu/books/innovation-and-growth-global-economy

He, D., & Zhang, W. (2010). How dependent is the Chinese economy on exports and in what sense has its growth been export-led?. *Journal of Asian Economics, 21*, 87-104. Retrieved from https://ideas.repec.org/a/eee/asieco/v21y2010i1p87-104.html

Heller, P.S., & Porter, R.C. (1978). Exports and growth. *Journal of Development Economics, 5*(2), 191-193. doi:10.1016/0304-3878(78)90007-x

Henriques, I., & Sadorsky, P. (1996). Export-Led Growth or Growth-Driven Exports? The Canadian Case. *The Canadian Journal of Economics / Revue Canadienne D'Economique, 29*(3), 540-555. doi:10.2307/136249

Heitger, B. (1987). Import protection and export performance-Their impact on economic growth. *Weltwirtschaftliches Archiv, 123*(2), 249–261. doi:10.1007/bf02706662

Hye, Q.M., Wizarat, S., & Wee-Yeap Lau, W.-P. (2013). Trade-led growth hypothesis: An empirical analysis of South Asian countries. *Economic Modelling, 35*, 654-660. https://doi.org/10.1016/j.econmod.2013.07.040

Im, K.S., Pesaran, M.H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics, 115*(1), 53-74. https://doi.org/10.1016/S0304-4076(03)00092-7

International Monetary Fund (2001). *Global Trade Liberalization and the Developing Countries*. Retrieved from https://www.imf.org/external/np/exr/ib/2001/110801.htm

Islam, M.N. (1998). Exports expansion and economic growth: Testing for Cointegration and Causality. *Applied Economics, 30*(3), 415-425. https://doi.org/10.1080/000368498325930

Jin, J.C., & Shih, Y.C. (1995). Export-led growth and the Four Little Dragons. *Journal of International Trade and Economic Development, 4*(2), 203-215. DOI:10.1080/09638199500000017

Jung, W.S., & Marshall, P.J. (1985). Exports, growth and causality in developing countries. *Journal of Development Economics, 18*(1), 1-12. https://doi.org/10.1016/0304-3878(85)90002-1

Jesus, F.J., & Lanzafame, M. (2020). The PRC's long-run growth through the lens of the export-led growth model. *Journal of Comparative Economics, 48*(1), 163-181. https://doi.org/10.1016/j.jce.2019.08.004

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics, 90*(1), 1-44. https://doi.org/10.1016/S0304-4076(98)00023-2

Kao, C., & Chiang, M.-H.. (2001). On the estimation and inference of a cointegrated regression in panel data. In B.H. Baltagi, T.B. Fomby, & R. C. Hill, *Nonstationary Panels, Panel Cointegration, and Dynamic Panels (Advances in Econometrics, Vol. 15)* (pp. 179-222). Bingley: Emerald Group Publishing Limited.

Katz, B., & Istrate, E. (2011). *Boosting Exports, Delivering Jobs and Economic Growth*. Project on State and Metropolitan Innovation, BROOKINGS-ROCKEFELLER. Retrieved from https://www.brookings.edu/wp-content/uploads/2016/06/0126_exports_katz_istrate.pdf

Kavoussi, R.M. (1984). Export expansion and economic growth. *Journal of Development Economics, 14*(1), 241–250. doi:10.1016/0304-3878(84)90052-x

Keesing, D.B. (1967). Outward-looking policies and economic development. *Economic Journal, 77*(306), 303-320. https://doi.org/10.2307/2229306

Khan, A.H., & Saqib, N. (1993). Exports and Economic Growth: The Pakistan Experience. *International Economic Journal, 7*(3), 53-63. https://doi.org/10.1080/10168739300080020

Kravis, I.B. (1970). Trade as a Handmaiden of Growth: Similarities Between the Nineteenth and Twentieth Centuries. *The Economic Journal, 80*(320), 850-872. doi:10.2307/2229902

Krueger, A.O. (1975). *The Benefits and Costs of Import Substitution in India: A Microeconomic Study*. Minneapolis: University of Minnesota Press. Retrieved from www.jstor.org/stable/10.5749/j.ctttsdwj

Krueger, A.O. (1978). *Foreign Trade Regimes and Economic Development: Liberalization Attempts and Consequences*. Boston: National Bureau of Economic Research, Inc. Retrieved from https://EconPapers.repec.org/RePEc:nbr:nberbk:krue78-1

Kugler, P. (1991). Growth, Exports and Cointegration: An Empirical Investigation. *Weltwirtschaftliches Archiv, 127*(1), 73-82. Retrieved from www.jstor.org/stable/40439969

Lee, F.-Y., & Cole, W.E. (1994). Simultaneity in the study of exports and economic growth. *International Economic Journal, 8*(2): 33-41. Retireved from https://www.tandfonline.com/doi/abs/10.1080/10168739400000011

Leff, N.H. (1969). The "Exportable Surplus" Approach to Foreign Trade in Underdeveloped Countries. *Economic Development and Cultural Change, 17*(3), 346–355. doi:10.1086/450363

Love, J., & Chandra, R. (2005). Testing export-led growth in South Asia. *Journal of Economic Studies, 32*(2), 132-145. https://doi.org/10.1108/01443580510600913

Lussier, M. (1993). Impacts of Exports on Economic Performance: A Comparative Study. *Journal of African Economies, 2*(1), 106–127. https://doi.org/10.1093/oxfordjournals.jae.a036768

Maizels, A. (1968). *Exports and Economic Growth of Developing Countries*. Cambridge: Cambridge University Press.

Mao, R., Yao, Y., & and Zou, J. (2019). Productivity growth, fixed exchange rates, and export-led growth. *China Economic Review, 56*, 1-21. https://doi.org/10.1016/j.chieco.2019.101311

Michaely, M. (1977). Exports and growth. *Journal of Development Economics, 4*(1), 49–53. doi:10.1016/0304-3878(77)90006-2

Moschos, D. (1989). Export expansion, growth and the level of economic development. *Journal of Development Economics, 30*(1), 93–102. doi:10.1016/0304-3878(89)90052-7

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and Statistics, 61*(S1), 653–670. https://doi.org/10.1111/1468-0084.0610s1653

Pedroni, P. (2004). Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory, 20*(3), 597-625. https://doi.org/10.1017/S0266466604203073

Ram, R. (1985). Exports and Economic Growth: Some Additional Evidence. *Economic Development and Cultural Change, 33*(2), 415-425. Retrieved from www.jstor.org/stable/1153235

Ram, R. (1987). Exports and Economic Growth in Developing Countries: Evidence from Time-Series and Cross-Section Data. *Economic Development and Cultural Change, 36*(1), 51-72. doi:10.1086/451636

Harris, R.D., & Tzavalis, E. (1999). Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of Econometrics, 91*(2), 201-226. https://doi.org/10.1016/S0304-4076(98)00076-1

Sengupta, J.K. (1991). Rapid Growth in NICs in Asia: Tests of New Growth Theory for Korea. *Kyklos, 44*(4), 561-580. https://doi.org/10.1111/j.1467-6435.1991.tb01797.x

Serletis, A. (1992). Export growth and Canadian economic development. *Journal of Development Economics, 38*(1): 133-145. https://doi.org/10.1016/0304-3878(92)90022-2

Severn, A.K. (1968). Exports and Economic Growth. *Kyklos, 21*(3), 546–548. doi:10.1111/j.1467-6435.1968.tb00132.x

Shan, J., & Sun, F. (1998). On the Export-Led Growth Hypothesis: The Econometric Evidence from China. *Applied Economics, 30*(8), 1055-1065. https://doi.org/10.1080/000368498325228

Sharma, A., & Panagiotidis, T. (2005). An Analysis of Exports and Growth in India: Cointegration and Causality Evidence (1971-2001). *Review of Development Economics, 9*(2), 232–248. doi:10.1111/j.1467-9361.2005.00273.x

Sheehey, E.J. (1993). Exports as a factor of production: A consistency test. *World Development, 21*(1), 155-160. https://doi.org/10.1016/0305-750X(93)90143-W

Singh, T. (2010). Does International Trade Cause Economic Growth? A Survey. *World Economy, 33*(11), 1517-1564. https://doi.org/10.1111/j.1467-9701.2010.01243.x

Srinivasan, T.N. (1985). Neoclassical political economy, the state and economic development. *Asian development review, 3*(2), 38-58.

Syron, R.F., & Walsh, B.M. (1968). The Relation of Exports and Economic Growth. *Kyklos, 21*(3), 541–545. doi:10.1111/j.1467-6435.1968.tb00131.x

Tang, C.F., Lai, Y.W., & Ozturk, I. (2015). How stable is the export-led growth hypothesis? Evidence from Asia's Four Little Dragons. *Economic Modelling, 44*, 229-235. https://doi.org/10.1016/j.econmod.2014.09.022

Tang, C.F., & Tan, E.C. (2015). The Relative Contributions of Domestic and Foreign Direct Investments and Exports to Malaysia's Economic Growth. *The Singapore Economic Review, 60*(2), 1550011. https://doi.org/10.1142/S0217590815500113

Tang, C.F., & Abosedra, S. (2019). Logistics performance, exports, and growth: Evidence from Asian economies. *Research in Transportation Economics, 78*, 100743. https://doi.org/10.1016/j.retrec.2019.100743

Tiwari, A.K. (2011). Tourism, Exports and FDI as a Means of Growth: Evidence from four Asian Countries. *Romanian Economic Journal, 14*(40), 131-151. Retrieved from https://www.researchgate.net/publication/227348951

Tyler, W.G. (1981). Growth and export expansion in developing countries. *Journal of Development Economics, 9*(1), 121–130. doi:10.1016/0304-3878(81)90007-9

Van den Berg, H., & Schmidt, J.R. (1994). Foreign trade and economic growth: Time series evidence from Latin America. *Journal of International Trade and Economic Development, 3*(3), 121-130. doi:10.1080/09638199400000016

Westerlund, J. (2005). New Simple Tests for Panel Cointegration. *Econometric Reviews, 24*(3), 297-316. https://doi.org/10.1080/07474930500243019

World Bank. (2018). *Stronger Open Trade Policies Enable Economic Growth for All.* Retrieved from https://www.worldbank.org/en/results/2018/04/03/stronger-open-trade-policies-enables-economic-growth-for-all

World Trade Organization (2021). *WTO in Brief.* Retrieved from https://www.wto.org/english/thewto_e/whatis_e/inbrief_e/inbr_e.pdf

APPENDIX: LIST OF 107 COUNTRIES USED IN ANALYSIS

Argentina	Colombia	Indonesia	Mozambique	Sierra Leone
Australia	Comoros	India	Mauritania	El Salvador
Austria	Costa Rica	Ireland	Mauritius	Slovenia
Belgium	Cuba	Iran, Islamic Rep.	Malaysia	Sweden
Benin	Cyprus	Iceland	Namibia	Eswatini
Burkina Faso	Czech Republic	Israel	Nigeria	Togo
Bangladesh	Germany	Italy	Nicaragua	Thailand
Bulgaria	Denmark	Jordan	Netherlands	Tunisia
Bahamas, The	Dominican Republic	Japan	Norway	Turkey
Belarus	Algeria	Kazakhstan	New Zealand	Tanzania
Belize	Ecuador	Kenya	Pakistan	Uganda
Bolivia	Egypt, Arab Rep.	Korea, Rep.	Panama	Ukraine
Brazil	Spain	Lebanon	Peru	Uruguay
Brunei Darussalam	Finland	Sri Lanka	Philippines	United States
Botswana	France	Lesotho	Portugal	Venezuela, RB
Canada	Gabon	Luxembourg	Paraguay	Vietnam
Switzerland	United Kingdom	Macao SAR, China	Romania	South Africa
Chile	Greece	Morocco	Russian Federation	Zambia
China	Guatemala	Madagascar	Rwanda	Zimbabwe
Cameroon	Hong Kong SAR, China	Mexico	Sudan	
Congo, Dem. Rep.	Honduras	North Macedonia	Senegal	
Congo, Rep.	Haiti	Mali	Singapore	

SEISENSE Journal of Management
Vol 5 No 1 (2022): DOI: https://doi.org/10.33215/sjom.v5i1.770 , 49-59
Research Article

A Review of Machine Learning Applications for Credit Card Fraud Detection with A Case study

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Article History
Received 2022-01-14
Revised 2022-02-10
Accepted 2022-02-03
Published 2022-02-15

Keywords
Machine learning,
Credit card fraud detection,
Artificial Neural Networks,
Logistic regression,
Random Forests,
XGBoost

How to cite?
Faraji, Z. (2022). A Review of Machine Learning Applications for Credit Card Fraud Detection with A Case study. SEISENSE Journal of Management, 5(1), 49-59. doi:https://doi.org/10.33215/sjom.v5i1.770

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Purpose - This paper aims to highlight the widely used supervised techniques applied for fraud detection. In addition, this paper aims to apply some techniques to evaluate their performance on real-world data and develop an ensemble model as a potential solution for this problem.

Design/Methodology- Different techniques applied in this study for fraud detection purposes are logistic regression, decision tree, random forest, KNN, and XGBoost. The confusion matrix gives information about the assignment of inputs to the different classes. This study uses precision and recall to evaluate the performance, calculated based on the confusion matrix.

Findings- XGBoost is the fastest and is expected to have the best performance; however, it is only outperforming the random forest in terms of accuracy, precision, recall, and f1-score. In general, the KNN and logistic regression have better performance, which means they better detect fraudulent transactions.

Practical Implications- The new model can be applied to new data instead of the previous techniques.

Introduction

Credit cardholders are encouraged to use their card over other ways of payment, such as debit cards. Indeed, there are some advantages to using credit cards compared with other payment methods; for example, they are so easy and fast to use, which support national or international transactions and withdrawing cash (Al Rubaie, 2021). However, some associated risks increase the attention for better credit card use management. Credit cards are an easy target for fraud, but detecting fraudulent transactions is usually an easy task (Al Rubaie, 2021; Dornadula, 2019). There are so many online businesses that only accept credit card transactions high usage of credit cards for online transactions led to the high number of fraudulent transactions.

Fraud detection is crucial, and the increasing trend of credit card online transactions makes strong prevention and detection techniques necessary. The total number of Visa and Master card users was about 2,183 million worldwide in 2020. Over 30% of the Visa card users and 24% of Master card users were in the United States (Alkhatib, 2021). The increasing number of cashless transactions resulted in an increasing trend of fraud rate for Card Not Present (CNP) transactions (Murli, 2015). In addition, the COVID pandemic led more people and merchants to use online transactions, highlighting the need to prevent and detect fraud. Consequently, Researchers and financial institutions are continuously seeking more efficient techniques to increase the safety of online transactions. Financial institutions are using prevention and detection mechanisms to check all the transactions, and Machine Learning (ML) techniques have been so helpful for this purpose.

There are different ML techniques to tackle credit card fraud detection, but we can classify them into main groups, including supervised, unsupervised, and reinforcement learning. The supervised learning techniques are applicable for classification and prediction problems, and data should be labeled for these techniques. This group contains techniques such as Support Vector Machine (SVM), Logistic Regression, Decision Tree, Naïve Bayes, K-Nearest Neighbor, Random Forest, Artificial Immune System, and Artificial Neural Network. On the other hand, the unsupervised learning techniques work with the unlabeled data and cluster the inputs based on their similarities. Some unsupervised ML techniques are K-means, Hidden Markov Model, Genetic Algorithm, Gradient Descendent, and DBSCAN (Zareapoor, 2015).

This paper is organized as follows: Section 2 gives information about the related credit card fraud detection techniques. Section 3 describes the experimental setup approach by explaining some data challenges, required pre-processing, and the different classifiers used to detect fraudulent credit card transactions. Section 4 presents the experimental results and discussion, and Section 5 concludes this work and provides some suggestions for future studies.

Literature Review

This section reviews some of the most important and widely used supervised classification techniques for credit fraud detection. Credit card fraud is a binary problem, as a transaction can be normal or fraudulent. The goal for the classification techniques is to classify a transaction based on the available features as fraud or legal.

Artificial Neural Network

Artificial Neural Network (ANN) imitates the human brain based on interconnected nodes or neurons. Each ANN has input, hidden, and output layers. Using ANN, the computer can learn from data and humanly make decisions. (Mehndiratta S. &., 2019). The neurons receive and process the signals and send them to the subsequent neurons for further process. There is a weighted connection between the active nodes in the associated layers. ANN has been widely used because of its ability to extract patterns in complex data. (Lim, 2021). Many researchers applied this algorithm for credit card fraud detection purposes (Murli, 2015; Paruchuri,

2017). The Convolution Neural Network (CNN) and Recurrent Neural Network (RNN) are two types of neural networks implemented by the researcher to detect fraudulent activities. (Tiwari, 2021).

Genetic Algorithm (GA)

The genetic algorithm can optimize different problems such as fraud detection and prevention for online transactions (Paruchuri, 2017). This method is a subset of the natural evolution idea to reproduce the fitter or stronger individuals for the next generation (Tiwari, 2021).

Logistic Regression

The logistic regression model is a generalized linear technique used when the predictive variable is binary. This technique uses the logistic function to model the probability for different classes (Tiwari, 2021). Logistic regression has been widely used for fraud detection (Ngai, 2011). Some studies showed that logistic regression could outperform other credit card fraud data (Paruchuri, 2017).

Decision Tree

A decision tree is a predictive model for classification and regression problems that map the inputs to the possible classes. This supervised technique has a tree-like structure that contains root nodes, other nodes that split the data based on the features, and leaves. At each node, the classes in the dataset are separated based on some conditions on the features. The splitting process achieves the fullest purity (Paruchuri, 2017). This technique is widely used for credit card fraud detections (Ngai, 2011; Paruchuri, 2017).

Random Forest

Random forest is another supervised technique that uses the bagging idea to improve the results by combining multiple single trees. This approach uses a random subset of each tree's features and a training dataset to overcome the disadvantages of a single decision tree (Tiwari, 2021). This method has been used for credit card fraud detection for online and offline transactions (Paruchuri, 2017).

Support Vector Machines (SVM)

SVM is another supervised method that is applicable for classification and regression problems. This technique can handle high-dimensional data by transforming a non-linear input into a linear task. SVM has been applied to detect different types of fraud in banking industries (Paruchuri, 2017). SVM creates the decision boundary to segregate the classes.

K-Nearest Neighbors (KNN)

KNN is a supervised method used for classification and regression challenges. This method classifies each input based on the nearest feature space in the training dataset without generalization (Lim, 2021; Mehndiratta S. &., 2019). This technique is fast but, as mentioned, doesn't make any generalizations. Indeed, if the K-nearest neighbors are fraudulent transactions, it is highly possible that a new instance is classified as fraudulent.

Naïve Bayesian Classifier

This method is only applicable for classification problems that leverage the Bayesian rules to calculate the conditional probabilities of the classes (Tiwari, 2021). The class with the highest conditional probabilities will be assigned to the instances. An important assumption for this model is that the effect of a feature on a given label is unrelated or independent from the value of the other features (Mehndiratta S. &., 2019).

Gradient Boosted Trees:

This is a supervised technique for classification and regression problems using an ensemble of decision trees. It uses the gradient boosting framework and builds sequences of weak models or trees, and at each iteration, it

tries to predict the error of the previous model (Mishra, 2018). XGBoost is based on gradient boosted decision trees, which are also applicable for categorical and continuous target variables. It is more regularized than gradient boosted trees for more generalization, resulting in better speed and performance (Meng, 2020).

Hidden Markov Model (HMM)

This stochastic model contains unobserved or hidden states that can be predicted by the underlying Markov Chain. Indeed, the only available information is the observational data, and there is no information related to the states. This model's main assumption is that future event are only related to the current state but not to the previous states (Tiwari, 2021).

Another way to tackle the fraud detection problem is combining or using multiple machine learning techniques to perform better. Different studies compared multiple methods together and even made a hybrid technique to boost the model (Faraji Z. , 2020; Faraji Z. , 2020; Asgharizadeh, 2014; Faraji, Z., Fleischhacker, A., 2020). Research tackled the credit card fraud detection problem with three supervised techniques, support vector machines, logistic regression, and random forests. One study compared the naïve Bayes model and logistic regression for fraud detection. The findings revealed that the naive Bayes model could converge faster, but the discriminative logistic regression has the lower asymptotic error (Ng, 2002). Another research studied the three models: logistic regression, decision tree, and the neural network for fraud detection. The findings showed the decision tree underperformed the other models (Shen, 2077). However, in another study, the decision tree outperformed the SVM and had better performance detecting fraudulent instances (Sahin, 2011)e findings suggested that the logistic regression had better performance. Still, SVM considered more fraudulent instances in the training data (Bhattacharyya, 2011). Another study applied 10 ML techniques and compared their performance using the accuracy and confusion matrix. They applied Decision Tree, KNN, SVM, Logistic Regression, Random Forest, Naïve Bayes, Gradient Boosting, XGB Classifier, and Stacking Classifier to detect the fraudulent instances logistic regression showed better performance (Dhankhad, 2019).

Different standard and hybrid machine learning techniques were used to detect credit card fraud activities in one study. The hybrid model applied the AdaBoost with majority voting technique for a real-world dataset in which noises were added to test the model robustness. Random Forest showed the best performance compared to other models in this study (Randhawa, 2018). Based on the literature, different machine learning techniques can be applied to detect fraud activities for the credit card. Each technique has its benefits and disadvantages (Faraji, Z., Fleischhacker, A., 2020; Faraji Z. , in press); however, a researcher should choose a technique based on the available data and associated feasibilities. For example, SVM requires lots of memory and considerable time to train the data. All the attributes should be independent for naïve Bayes; KNN needs scaled data, which is not applicable for high-dimensional data (Uchhana, 2021). Indeed, it is necessary to consider the data and computation limitations to choose the appropriate technique (Faraji, Z., Fleischhacker, A., 2020; Faraji Z. , 2020).

Research Method

Data Challenges

Usually, the dataset for fraud detection is unbalanced as the number of fraudulent transactions is considerably less than the normal transactions. All the previously mentioned methods can predict the majority class in the data, but the fraudulent class is considered noises. Therefore, misclassification for minority class instances is high while using the standard techniques for fraud data (Mishra, 2018). However. The goal is to classify the minority class with good performance. One solution is to apply the Synthetic Minority Oversampling Technique (SMOTE) for raw data before the modeling. SMOT oversamples the minority class and under samples the

majority class. Indeed, the new dataset is balanced. This method creates "synthetic" from the minority class using the KNN technique (Mishra, 2018).

Even if the model classifies all the instances as normal transactions with highly imbalanced fraud data, the accuracy would be high but misleading. Therefore, accuracy is a weak performance metric for fraud data. This study uses precision and recall to evaluate the performance, calculated based on the confusion matrix. The confusion matrix gives information about the assignment of inputs to the different classes. The following table shows the confusion matrix (Al Rubaie, 2021).

Table 1. Confusion Matrix

	Confusion Matrix	
	Positive (Fraud)	**Negative (Normal)**
Positive (Fraud)	True Positive (TP)	False Negative (FN)
Negative (Normal)	False Positive (FP)	True Negative (TN)

The performance metrics can be calculated based on the confusion matrix as follows:

True Positive (TP) = number of fraud transactions predicted as fraud

True Negative (TN) = number of legal transactions predicted as legal

False Positive (FP) = number of legal transactions predicted as fraud

False Negatives (FN) = number of fraud transactions predicted as legal

These values are applied to compute the following (Zareapoor, 2015):

$$Accuracy = \frac{\mathrm{TP} + \mathrm{TN}}{\mathrm{TP} + \mathrm{FP} + \mathrm{TN} + \mathrm{FN}}$$

$$Recall = \frac{\mathrm{TP}}{\mathrm{TP} + \mathrm{FN}}$$

$$Precision = \frac{\mathrm{TP}}{\mathrm{TP} + \mathrm{FP}}$$

$$F_1 = \frac{\mathrm{TP}}{\mathrm{TP} + \frac{1}{2}(\mathrm{FP} + \mathrm{FN})}$$

Data Description

The data for this study is public data available on the Kaggle website. The data contains 284,807 transactions in a two-day duration that only a tiny fraction of that is labeled as fraudulent transactions. There are 28 features in the dataset transformed by principal component analysis (PCA). The transaction amount is another feature that needs to be scaled before training the model. The next table summarizes the transaction distribution, and Figure 1 visualizes the imbalance data.

Table 2. Data Description

Total Transaction	Legal	Fraud	Fraud rate
284, 807	284315	492	0.173%

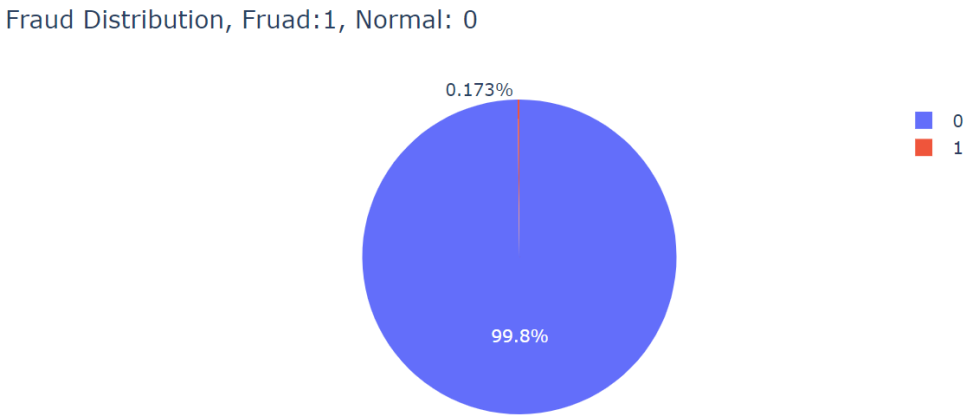

Figure 1. Fraud Data Distribution

Our Approach

The different classification techniques are applied in this study for fraud detection purposes are logistic regression, decision tree, random forest, KNN, and XGBoost. Their performances are compared to see which model can better extract the relationship between the features and detect fraudulent transactions. The logistic regression estimates the probabilities by using a logistic regression equation to model the relationship between the dependent and independent variables. The decision tree is another classification model that is applied to the data. This model has some advantages, such as being easy to interpret the results and visualize the tree, making it easier to communicate with non-technical persons. The random forest is applied to the dataset as an ensemble model that includes more trees. The final results are based on the most frequent predictions by individual trees. The gradient boosting method is a tree-based learning algorithm with a sequence of decision trees built on the previous trees' errors. This model is fast and can be an excellent choice for fraud data. In addition, cross-validation and hyperparameters tuning is applied for all the models in this study to find the best fit and avoid overfitting.

After training all the classifiers, a new ensemble model will be applied as a voting classifier to combine all the other classification techniques. The objective is to reduce the errors of single models, which helps the ensemble model make better predictions compared with the individual classifiers. If all the classifiers are considered as C_1, C_2, C_3, C_4 , and C_5, then the final classifier will take the votes as the majority of votes as the final prediction or C_t.

$$C_t = Majority\{C_1, C_2, C_3, C_4 , C_5\}$$

Results

The next table shows the model's performance before balancing the data. According to Table 3, the uneven instances in the data resulted in poor performance for most of the models. Figure 2 shows the performance of the XGBoost model, which is overperforming the other models. Most accuracy scores are high as most normal transactions are classified correctly in imbalanced data. However, by looking at the other metrics, it is clear that the precision, recall, and f1-score are lower than the accuracy. Also, the XGBoost model is overperforming the other techniques based on all the metrics.

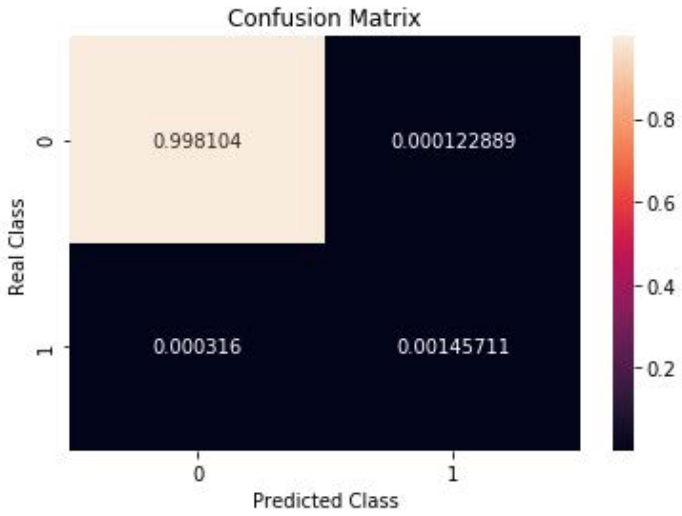

Figure 2. Confusion Matrix for Unbalanced Data (XGBoost Model)

Table 3. Mode Performance for Unbalanced Data

Methods	Accuracy	Precision	Recall	F1-score
Logistic regression	0.81	0.90	0.63	0.74
Decision tree	0.99	0.77	0.76	0.77
Random forest	0.99	0.94	0.78	0.85
KNN	0.86	0.91	0.72	0.81
XGBoost	0.99	0.92	0.82	0.87

In the next step, the data is balanced using the SMOT method to oversample the fraud transactions and under-sample the normal transactions. Figure 3 shows the new distribution for the dataset.

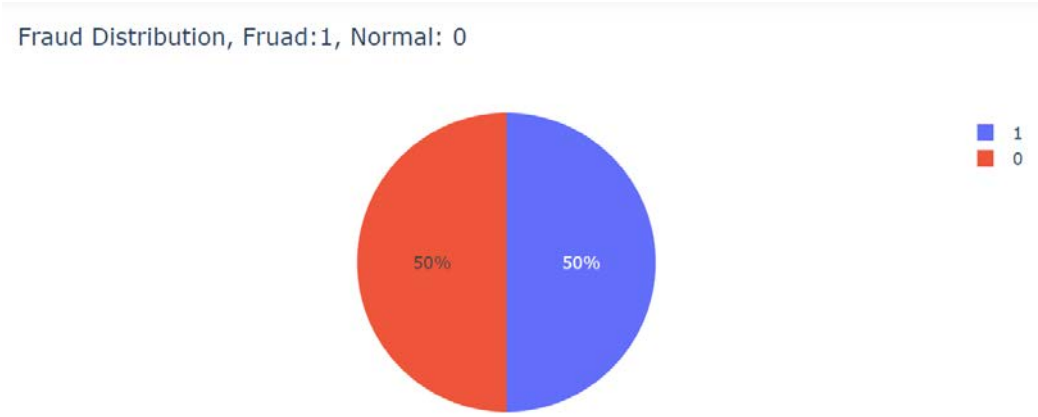

Figure 3. Fraud Data Distribution for Balanced Data

After balancing the data, all the previous machine learning techniques are applied. The next figure shows the confusion matrix for the XGBoost model, which illustrates the performance improvement after leveraging the SMOT method.

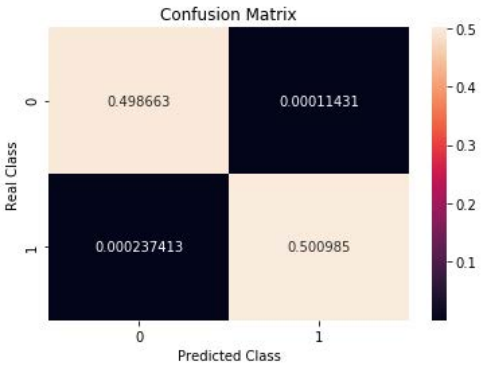

Figure 4. Confusion Matrix for Balanced Data (XGBoost Model)

Table 4 gives detailed information about the performance measurements for all the applied models. A new ensemble model is also applied as a voting classifier to combine all the other classification techniques. The idea is that the ensemble model is stronger than the single model. The results are based on voting on the predicted classes, aiming to reduce the error. According to Table 4, the voting classifier model outperforms the other models.

Table 4. Mode Performance for Balanced Data

Methods	Accuracy	Precision	Recall	F1-score
Logistic regression	0.98	0.98	0.93	0.96
Decision tree	0.99	0.77	0.76	0.77
Random forest	0.99	0.93	0.78	0.85
XGBoost	0.99	0.93	0.83	0.88
KNN	0.98	0.98	0.94	0.96
Ensemble	0.99	0.99	0.99	0.99

The logistic regression performance is better than the decision tree, and the XGBoost outperforms the random forest in terms of accuracy, precision, recall, and f1-score. The KNN and logistic regression have better performance than other models. Their low false-negative rates mean better at capturing the fraudulent transactions and extracting the data pattern. The ensemble model gains better results by reducing the errors of the other models. Figure 5 visualizes the performance measurements.

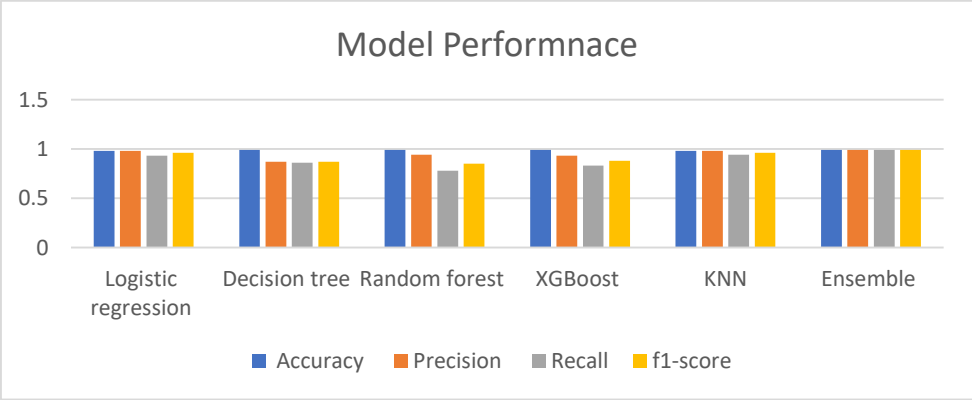

Figure 5. Model Performance

Discussion

The ensemble model gains better results by reducing the errors of the other models. The logistic regression is the most straightforward technique in this paper, but its performance is better than the decision tree. The XGBoost is the fastest and expected to have the best performance; however, it is only outperforming the random forest in terms of accuracy, precision, recall, and f1-score. In general, the KNN and logistic regression have better performance, which means they better detect fraudulent transactions. These models are more straightforward than XGBoost, highlighting that the model complexity doesn't guarantee good performance. Each dataset has its features and requires investigation to find the appropriate model.

Conclusion

This paper reviewed the machine learning techniques for credit card fraud detection problems. Fraud is an important problem for financial institutions; therefore, applying a model that can handle the data fast and efficiently is critical. Balancing the data is so crucial to achieving a stable and generalized approach. Being familiar with the different algorithms can be helpful to make a better decision to choose the right technique. In this paper, five different supervised techniques were applied for public Kaggle data and their performance was investigated with imbalance data and the balanced data. in addition, a new ensemble model was applied to improve the performance of the individual classifiers.

Limitations and Future Research

There are some limitations to this study; one limitation is the data. The data for this study was limited to one financial institution, which indicates that the results cannot be generalized for all the banks or financial institutions. Future studies can investigate the ML techniques with larger datasets. Also, another limitation is that the unsupervised techniques are not used in this study. In future studies, the new ensemble model can be applied for a group of supervised and unsupervised techniques to see the possibility of performance improvement. In future works, the unsupervised machine learning algorithms can be reviewed and compared with supervised techniques. In addition, the data for this study has only numerical features. However, other types of the data, such as textual data, can be beneficial to improve the fraud detection process.

Funding: This research received no external funding

Conflicts of Interest: The authors declare no conflict of interest

References

Al Rubaie, E. M. (2021). Improvement in credit card fraud detection using ensemble classification technique and user data. International Journal of Nonlinear Analysis and Applications, 12(2), 1255-1265.

Alderson, A. S., Beckfield, J., & Nielsen, F. (2005). Exactly how has income inequality changed? Patterns of distributional change in core societies. International Journal of Comparative Sociology, 46(5-6), 405-423.

Alkhatib, K. I.-A. (2021). Credit Card Fraud Detection Based on Deep Neural Network Approach. 12th International Conference on Information and Communication Systems (ICICS) (pp. 153-156). IEEE.

Anjum, A., Yasmeen, K., & Khan, B. (2011). Performance Appraisal Systems In Public Sector Universities Of Pakistan. International Journal of Human Resource Studies, 1(1), 41-51. Retrieved from http://www.macrothink.org/journal/index.php/ijhrs

Armstrong M. (2006). A Handbook of Personnel Management Practice (6th ed.). London: Kogan Pag.

Asgharizadeh, E. S. (2014). Supply chain performance measurement by combining criterions of SCOR, Gunasekaran and BSC models with REGIME technique. Journal of Basic Applied Scientific Research, 4(3), 309-320.

Bhattacharyya, S. J. (2011). Data mining for credit card fraud: A comparative study. Decision support systems, 50(3), 602-613.

Ciarniene, R. and Vienazindiene, M. (2010). Critical Issues for Compensation and Incentives Management: Theoretical Approach. Management Theory and Studies for Rural Business Infrastructure Development, 5(24), 15-21.

Danish, R.Q, & Usman, A. (2010). Impact of Reward and Recognition on Job Satisfaction and Motivation: An Empirical Study from Pakistan.,. International Journal of Business and Management, 5(2), 159-167.

Dhankhad, S. M. (2019). Credit card fraud detection using machine learning algorithms. Procedia computer science, 165, 631-641.

Dornadula, V. N. (2019). Credit card fraud detection using machine learning algorithms. Procedia computer science, 165, 631-641.

Faraji, Z. (2020). The Causal Analysis of Financial Distress Risk and Performance. American International Journal of Business Management, 3(5), 5.

Faraji, Z. (2020). Measuring Corporate Diversification Effect Sizes from Observational Data Using Bayesian Causal Approaches. University of Delaware.

Faraji, Z. F. (2020). Overstatement of firm diversification effect on bankruptcy risk reduction. International Journal of Applied Decision Sciences, 13(3), 267-285.

Faraji, Z. (in press). Investigate the causal effect of diversification strategy on risk-adjusted performance using Bayesian additive regression trees. International Journal of Information and Decision Sciences.

Gazioglu, S. and A. Tansel. (2006). Job Satisfaction in Britain: Individual and Job Related Factors. Applied Economics, 8, 1163-1171.

Iqbal, M. Z., Arif, M. I., and Abbas, F. (2011). HRM Practices in Public and Private Universities of Pakistan: A Comparative Study. International Education Studies, 4(4), 215-222.

Karatepe, O. M., & Vatankhah, S. (2015). High-performance work practices, career satisfaction, and service recovery performance: a study of flight attendants. Tourism Review, 70(1), 56-71.

Khurram,S., & Sajid Bashir. (2008). Impact of HR Practices on Perceived Performance of. International Review of Business Research Papers, 4(2), 302-315.

Kwenin, D.O., Muathe, S., & Nzulwa, R. (2013). The Influence of Employee Rewards, Human Resource Policies and Job Satisfaction on the Retention of Employees in Vodafone Ghana Limited. European Journal of Business and Management, 5(12), 2222-2839.

Kwenin, D.O., Muathe, S., & Nzulwa, R. (2013). The Influence of Employee Rewards, Human Resource Policies and Job Satisfaction on the Retention of Employees in Vodafone Ghana Limited. European Journal of Business and Management, 5(12), 2222- 2839.

Lai, H. (2012). A Study of the Relationship among the CompensationManagement, Operational and Organisational Climate. International Journal of Organisatonal Innovation, 231-249.

Lamba, S., and Choudhary, N. (2013). Impact of HRM Practices on Organizational Commitment of Employees. International Journal of Advancements in Research & Technology, 2(4), 407-423.

Lim, K. S. (2021). A Review of Machine Learning Algorithms for Fraud Detection in Credit Card Transaction. International Journal of Computer Science & Network Security, 21(9), 31-40.

Majumder, T. H. (2012). Human Resource Management Practices and Employees' Satisfaction Towards Private Banking Sector in Bangladesh. International Review of Management and Marketing, 2(1), 52-58.

McIvor,R. (2007). Outsourcing and the spin-off arrangement: lessons from a utility company. Journal of General Management,, 33(1), 51-70.

Mehndiratta, S. &. (2019). Credit card fraud detection techniques: a review. Int. J. Computer Sci. Mobile Computing, 8(8), 43-49.

Mehndiratta, S. &. (2019). Credit card fraud detection techniques: a review. Int. J. Computer Sci. Mobile Computing, 8(8), 43-49.

Mello, J.A. (2007). Strategic Human Resource Management (2nd ed.). India: Cengage.South-Western.

Memon, S.B., Panhwar, A.I. & Rohra, L.C. (2010). Investigating the Mediating Role of Human ResourPolicies in Employee Retention. Australian Journal of Basic and Applied Science, 4(8), 4046-4057.

Memon, S.B., Panhwar, A.I. & Rohra, L.C. (2010). Investigating the Mediating Role of Human Resource Policies in Employee Retention. Australian Journal of Basic and Applied Sciences, 4(8), 4046-4057.

Memon, S.B., Panhwar, A.I. & Rohra, L.C. (2010). Investigating the Mediating Role of Human Resource Policies in Employee Retention. Australian Journal of Basic and Applied Sciences., 4(8), 4046-4057.

Meng, C. Z. (2020). A case study in credit fraud detection with SMOTE and XGboost. In Journal of Physics: Conference Series (Vol. 1601, No. 5, p. 052016). IOP Publishing.

Mishra, A. &. (2018). Credit card fraud detection on the skewed data using various classification and ensemble techniques. In 2018 IEEE International Students' Conference on Electrical, Electronics and Computer Science (SCEECS) (pp. 1-5). IEEE.

Muhammad Usman, W. A. (2015). Role of Board and Firm Performance in Determination of CEO Compensation: Evidence from Islamic Republic of Pakistan. Pakistan Journal of Commerce and Social Sciences, 9(2), 641-657.

Murli, D. J. (2015). Credit card fraud detection using neural networks. International Journal of Students' Research in Technology & Management, 2(2), 84-88.

Ng, A. Y. (2002). On discriminative vs. generative classifiers: A comparison of logistic regression and naive bayes. In Advances in neural information processing systems, 841-848.

Ngai, E. W. (2011). The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature. Decision support systems, 50(3), 559-569.

Onukwube, H, N. (2012). Correlates of job satisfaction amongst quantity surveyors in consulting firms in Lagos, Nigeria. . Australasian Journal of Construction Economics and Building, 12(2), 43-54.

Padala, S.R. (2011). Employees‟ Job Satisfactions and Organisational Commitment in Nagarjuna Fertilizers and Chemicals Limited, India. ‚Journal of Research in International Business and Management, 1(1), 17-27.

Paruchuri, H. (2017). Credit Card Fraud Detection using Machine Learning: A Systematic Literature Review. ABC Journal of Advanced Research, 6(2), 113-120.

Plant, T. (2006). The Performance Measurement Paradox in Local Government Management in Pm. Public Management, 88(4), 16-20.

Qasim, S. Cheema, F.E.A., & Syed, N.A. (2012). Exploring Factors Affecting Employees Job Satisfaction at Work. Journal of Management and Social Sciences,, 8(1), 31-39.

Randhawa, K. L. (2018). Credit card fraud detection using AdaBoost and majority voting. IEEE access, 6, 14277-14284.

Sahin, Y. a. (2011). Detecting Credit Card Fraud by Decision Trees and Support Vector Machines. Proceedings of International Multi-Conference of Engineers and Computer Scientists (IMECS 2011). Hong Kong: Vol. 1, pp. 1- 6, ISBN: 978-988-18210-3-4, ISSN: 2078-0966 (Online).

Shen, A. T. (2077). Application of classification models on credit card fraud detection. International conference on service systems and service management (pp. 1-4). IEEE.

Terera, S.R., & Ngirande, H. (2014). The Impact of Rewards on Job Satisfaction and Employee Retention. Mediterranean Journal of Social Sciences, MCSER Publishing,Rome-Italy., 5(1), 2039-2117.

Terera, S.R., & Ngirande, H. (2014). The Impact of Rewards on Job Satisfaction and Employee Retentions. Mediterranean Journal of Social Science, 5(1), 2039-2117.

Tessema, M. and Soeters, J. (2006). Challenges and prospects of HRM in developing countries: testing the HRM-performance link in Eritrean civil service. International Journal of Human Resource Management, 17(1), 86-105.

Tiwari, P. M. (2021). Credit Card Fraud Detection using Machine Learning: A Study. arXiv preprint arXiv, 2108.10005.

Uchhana, N. R. (2021). Literature Review of Different Machine Learning Algorithms for Credit Card Fraud Detection. International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-10 Issue-6.

Vikram Jeet, Dr Sayeeduzzafar. (2014). A study of HRM practices and its impact on employees job satisfaction in private sector banks: A case study of HDFC Bank. International Journal of Advance Research in Computer Science and Management Studies, 2(1), 62-68.

Zareapoor, M. &. (2015). Application of credit card fraud detection: Based on bagging ensemble classifier. Procedia computer science, 48, 679-685.

SEISENSE Journal of Management
Vol 5 No 1 (2022): DOI: https://doi.org/10.33215/sjom.v5i1.790 , 60-71
Research Article

Technostress and Telecommuting in the Context of Covid-19: Evidence from Cambodia's Higher Education Institutes

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Article History
Received 2022-02-28
Revised 2022-04-16
Revised 2022-05-16
Accepted 2022-05-17
Published 2022-05-20

Keywords
Anxiety
Covid-19
Education
Fatigue
Inefficacy
Skepticism
Technostress
Telecommuting

How to cite?
Ly, R., & Ly, B. (2022). Technostress and Telecommuting in the Context of Covid-19: Evidence from Cambodia's Higher Education Institutes. SEISENSE Journal of Management, 5(1), 60-71. doi:10.33215/sjom.v5i1.790

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Abstract

Closures of educational establishments owing to the COVID-19 pandemic have impacted individuals globally. Educational organizations of all levels have been compelled to use online instruction because comprehensive safety precautions have been taken to minimize the spread of disease during the COVID-19 contagion, which has increased technostress. Both public and private organizations utilized these strategies, allowing the individual to work virtually.

Purpose- This work examines the association between the perceived technostress attributes and instructors in Cambodian academic institutions during the COVID-19 pandemic.

Design/Methodology- It used a quantitative method and constructed a research instrument to examine (340 participants) of public and private instructors service during the outbreak. Additionally, the data was collected and analyzed using structural equation modeling (SEM).

Findings- The study revealed that technostress had a substantial effect on the gender, age, and working experience of educators. Hence, given the rapid evolution of ICT trends, it is appropriate to design practical training and wellness programs to alleviate technostress and foster a sense of technological competence and personal relevance.

Introduction

The Covid-19 outbreak that emerged in late 2019 has expanded rapidly worldwide. The virus had infected approximately 241 million people worldwide, resulting in nearly 5 million deaths as of October 2021 (World Health Organization, 2021). As a result, most academic institutions across the nation closed their sites, shuttered halls, and switched the remainder of the semester to virtual classrooms because of the out-of-control virus. Thanks to this option, students could finish courses and continuously progress academically. However, lecturers received very little notice before moving in-person courses to the online setting. Equally, academics immediately adapted by leveraging digital or blended learning spaces to blend and synchronize information and communication technologies (ICTs) to keep up with the rapidly changing classroom environment. Thus, educators play a significant role in bringing technology into the classroom. However, technology implementation hinges on instructors' adoption, which has proven to be a substantial challenge in educational settings (Yuen & Ma, 2008). While lecturers are the first to adopt technology and innovate education, they also endure a lot of job pressure because they must keep up with the latest developments in their fields (Li & Wang, 2021). Even though using technology in education is recommended, several studies have found numerous roadblocks to overcome, insufficient technological expertise support, poor infrastructure, and inadequate training. Lecturers may become anxious and stressed because of these difficulties, leading to physical and mental health problems associated with the use of technology (Joo et al., 2016). As a result, technostress is currently a significant issue in schooling. Also, it is caused by social and institutional pressures on instructors to integrate technology. These unfavorable feelings about using technology for online teaching can inhibit educators from using it and seriously affect learning and student outcomes. Therefore, this work gauged the impact of technostress on educators lecturing at higher education institutions in Cambodia, where organizations were closed as a safety concern in the wake of Covid-19. Additionally, it contributes to the body of knowledge on the subject, which can be utilized to establish policies and initiatives for effective ICTs in education beyond the Covid-19 pandemic.

Technostress and COVID-19

Technostress is characterized as the incompetence of an individual in dealing with problems using technology (Tarafdar et al., 2007). It does not typically manifest itself abruptly. Also, it is a nuanced notion with some antecedents. Among the determinants of technostress is an incapability to use a computer effectively, concern about limited personal performance, incompetence to comprehend information overload, the rate of digitalization, and heavy workloads (Okebaram & Moses, 2013). The stress related to ICT use has been examined in various domains, particularly in higher education institutions (Bondanini et al., 2020; Penado Abilleira et al., 2020; Wang et al., 2020b). Likewise, technological stress is a severe disease globally (Bozionelos, 1996; Khan et al., 2016; Lee et al., 2016; Tu et al., 2005). The consequences are seen throughout the globe. For example, stress costs the US economy about $300 billion annually because of decreased productivity, staff turnover, absenteeism, and workplace accidents (Smith, 2016). However, the losses from technostress are very undoubtedly significant. Educators who are techno-stressed may exhibit several physical and mental symptoms, including anxiety, frustration, exhaustion, failure to focus, high hydrocortisone generation, frustration, suspicious, depression, and intrusive feelings (Cox et al., 2000; Mahalakshmi & Sornam, 2012; Wang et al., 2008).

On January 30, 2020, WHO proclaimed the COVID-2019 pandemic a public health emergency triggering a global lockdown (Wang et al., 2020a). Several authorities embrace modern technology to combat COVID-19, resulting in civilian techno-stress (Bartoszko, 2020). Many initiatives have been put in place to control the spread of this infection, the most important of which was the virtual workplace, which isolated individuals in their homes (Coccia, 2020; Molino et al., 2020). Although it was not commonly used in Cambodia before the Covid-19 lockdown, telecommuting has evolved into a necessary and prevalent option. In addition to significant

changes in behavior, the effects on mental health were also due to trends. These factors have been linked to several psychological problems, including increased stress and diminished mental well-being (Coccia, 2020). The pandemic intensified ICT diffusion in all spheres of society, and while the full extent of its impact is unknown, technostress may rise as a result (Bondanini et al., 2020). This approach is plainly at odds with the necessity of rapid ICT change during Covid-19. The rapid pace of change may have elevated the potential of technostress for all individuals concerned.

Conversely, the adoption of ICTs has significant adverse effects on organizations and individuals. Disruptions in organizational operations, individual functions, and roles induced by ICTs have made organizational behavior a primary source of stress for the workers today (Rowden, 2005). In addition, more and more people are concerned about the invasive nature of technology in their personal lives (Bright & Logan, 2018; Salo et al., 2018).

Technostress and Educators

Technostress is stress associated with ICT usage mainly caused by the abrupt pace of technological progress (Şahin & Çoklar, 2009). Consequently, it has the potential to have a wide range of adverse implications for employees and their organizations (Fuglseth & Sørebø, 2014; Hsiao, 2017; Tarafdar et al., 2015). Additionally, it can form anxiety, fatigue, and depression, with lower productivity and job satisfaction (Wang et al., 2020b). According to Penado Abilleira et al. (2021), the anxiety aspect (techno-anxiety) encompasses psychological (anxiety of causing damage to the system), social (anxiety about being displaced by technology), and operational (anxiety of technological incompetence). Alongside anxiety, technology users experience fatigue (techno-fatigue), weariness, and mental and behavioral exhaustion (Penado Abilleira et al., 2021). Furthermore, skepticism (techno-skepticism) is a technostress's disposition attribute; it represents the unfavorable assessments caused by technology use, for example, insensitivity or an alienated attitude toward technology (Salanova et al., 2011). Lastly, it is a negative sentiment about their capacity to use technology efficiently (techno-inefficacy) (Salanova et al., 2013).

However, ICTs are being adopted quickly in work environments, organizations, and educational settings (Manco-Chavez et al., 2020; Matteucci et al., 2005). Although teaching is not a conventional classroom role, many institutions integrate ICT, flipped classrooms, open and distance programs, and linked novice technologies (Li & Wang, 2021). However, Çoklar et al. (2016) argue that institutional and cultural pressure to integrate technology into education might cause technostress among instructors. Individual difficulties, technological challenges, education-related difficulties, health issues, and time constraints are all common causes of educator technostress. Likewise, several conditions could cause it. First, learning new practices, tools, and terminology can add to workload and time constraints. Second, lecturers may need to adapt their practices because technology has become more prevalent in the classroom. Third, technostress occurs when instructors feel obligated to use technology even if it is not their preferred method (Syvänen et al., 2016). Lastly, insufficient technology development may result in confusion, annoyance, and a reluctance to use it.

Numerous studies have been performed to ascertain how technostress affects educators. For example, according to Syvänen et al. (2016), female teachers were seen to suffer more than male instructors, and those with practice (16-30 years) in the profession experienced higher levels of technostress than less experienced personnel (15 years or under). They argue that job-related characteristics may have a more significant impact on technostress than demographic factors and suggest that ICT competence is the most critical determinant of technostress. Also, Çoklar et al. (2016) argue that it is essential to note that there are disparities between female and male lecturers in terms of technostress. They claim that women tend to be more stressed out about the need for technical assistance, system, and connection issues, while men tend to be more stressed out about personal issues like self-efficacy and their attitude about technology use in general and the current economic condition. Likewise, Dong et al. (2020) concluded from their investigation of 366 Chinese K-12 in-service

teachers that technological pedagogical content knowledge was associated with teacher technostress. They further argue that teacher self-efficacy was more significant than institutional support, and training courses would have to include problem-solving skills instead of specialized processes for specific situations since this can lead to enhanced confidence. Equally, Al-Fudail and Mellar (2008) claimed that technostress is caused by a mismatch between teachers' subjective and objective needs to use technology and their abilities.

Furthermore, Alvites-Huamaní (2019) revealed a strong correlation between stress and psychological variables, including work conditions, workloads, characteristics of responsibilities, academic roles, advancement in careers, social contacts, and organizational factors in basic and higher education teachers in Latin America, North America, and Europe. On the other hand, Mondal et al. (2011) found that educators reported modest to moderate stress levels and partial job satisfaction. This was probably due to difficult working conditions and the need for institutional assistance and recognition. Also, educators are particularly vulnerable to burnout due to various stressors, including sudden changes in terms and conditions of employment without notice, the assignment of responsibilities without decision-making authority, and a lack of resources to complete the work (Agai–Demjaha et al., 2015). This influences the mental and behavioral health of the student body and school performance; therefore, it is crucial to apply appropriate stress management strategies to address difficulties with student behavior or classroom management (von der Embse et al., 2019). Recently, the integration of ICTs into education has emerged as a topic of interest, requiring instructors to possess the skills necessary to use and integrate ICTs as a learning tool, resulting in the stress known as technostress.

Therefore, the following research hypotheses were proposed for additional study based on established analysis:

H1: Perceived experience of techno-anxiety is positively associated with the gender of educators

H2: Perceived experience of techno-anxiety is positively associated with the age of educators

H3: Perceived experience of techno-anxiety is positively associated with the working experiences of educators

H4: Perceived experience of techno-fatigue is positively associated with the gender of educators

H5: Perceived experience of techno-fatigue is positively associated with the age of educators

H6: Perceived experience of techno-fatigue is positively associated with the working experiences of educators

H7: Perceived experience of techno-skepticism is positively associated with the gender of educators

H8: Perceived experience of techno-skepticism is positively associated with the age of educators

H9: Perceived experience of techno-skepticism is positively associated with working experiences of educators

H10: Perceived experience of techno-inefficacy is positively associated with the gender of educators

H11: Perceived experience of techno-inefficacy is positively associated with the age of educators

H12: Perceived experience of techno-inefficacy is positively associated with the working experiences of educators

Methods and Materials

This work applied a quantitative method and developed a research instrument to investigate the relationship between the attributes pointed to technostress's perceived experience and instructors in Cambodian institutions' education. The measurement instrument and questionnaire have addressed the specific aims of the study based on a theoretical review.

The measurement of technostress was compiled from previous technostress literature (e.g., Dong et al., 2020; Penado Abilleira et al., 2020; Salanova et al., 2013; Wang et al., 2020b). These scales have four constructs (Anxiety, Fatigue, Inefficacy, and Skepticism) and sixteen items evaluating their significance on a five-point Likert scale (from strongly disagree to strongly agree). In addition, confirmatory Factor Analysis (CFA) was used to validate the instrument for measuring technostress. The CFA approach determined how observed variables are essential with the applied latent construct. This analysis is based on the strength of the regression model connecting the factors to the observed variables rather than the relationship of the variables (Byrne, 2010). Equally, Byrne (2010) suggests that a sample size of five to ten times the total number of survey items while doing CFA, and this study had 16 items; therefore, n=160 was deemed sufficient. Statistical Package for Social Science (SPSS) version 25 was applied for statistical analysis, and a significance level of .05 was specified. The Kaiser–Meyer–Olkin (KMO) sampling adequacy measure and Bartlett's test of sphericity were used to determine whether the sample was appropriate for this study. The total variance explained was 62.9%. Also, Fornell and Larcker (1981) claim that acceptable internal consistency requires Cronbach's alpha > 0.70. Likewise, when the $\chi 2/df$ value is less than 5.0, hypothesis models correspond to the analyzed data (Marsh & Hocevar, 1985).

Participants and Sampling

Convenience sampling techniques were used because of their convenience and availability (Bryman, 2016) through self-administered questionnaires to determine the sample of personnel work-related instructors in Cambodia during the COVID-19 epidemic that participated in this study.

The report yielded a total return of 340 distributed questionnaires, more than the minimum threshold of 160. The profile of respondents revealed that 77.6% were male, and 22.4% were female. Equally, 75.3% and 24.7% worked in public and private institutions. In addition, 62.1% were undergraduate (Bachelor), 28.2% were graduate (Master), 5% were vocational (Skill courses), and the remaining 4.7% were post-graduate (Doctorate) in qualification. Related to the working settings, 85.3% worked full-time, and 14.7% employed part-time. Also, it is essential to realize that 43.1% of lecturers sampled have an average teaching experience of 5-10 years, 40.3% with more than 10 years, and only 16.5% was less than 5 years of experience. Similarly, 48.5% were aged 36-52 years, 46.8% were less than 35, 2.4% were 52-64, and the remaining 2.4% were 65 years and above.

Assessment of Measurement Model

This work established a measuring model to check for structural and reliability and convergent and discriminant validity. First, the high loading values for each indicator should be verified in the measurement model. According to Hair et al. (2019), it should be over 0.70. Next, the internal consistency of the constructs was calculated utilizing composite reliability (CR) and Cronbach's alpha coefficients. A value of 0.7 or more is appropriate for CR and Cronbach's alpha (Hair et al., 2019). Finally, this study examined the AVE values of variables for convergent validity. The findings of the measuring model are illustrated in **Table 1**.

As demonstrated in **Table 1**, all constructions have adequate internal consistency with CR and CA values > 0.70. Similarly, construct reliability was more considerable than 0.7 to establish convergence validity among the constructs (Hair et al., 2013, 2019). Also, acceptable AVE should be 0.50 or higher (Hair et al., 2019). Therefore, there was enough validity and reliability to support the analytical study.

Table 1. Results of Confirmatory Factor Analysis (n = 340)

Constructs	Loadings	CA	CR	AVE
TA1	0.79	0.77	0.86	0.60
TA2	0.76			
TA3	0.90			
TA4	0.64			
TF1	0.81	0.74	0.83	0.56
TF2	0.81			
TF3	0.57			
TF4	0.79			
TI1	0.82	0.81	0.88	0.65
TI2	0.74			
TI3	0.83			
TI4	0.82			
TS1	0.81	0.80	0.87	0.63
TS2	0.78			
TS3	0.70			
TS4	0.87			

Cronbach's alpha (CA), Composite Reliability (CR), Average Variance Extracted (AVE)
Techno-Anxiety (TA), Techno-Fatigue (TF), Techno-Inefficacy (TI), Techno-Skepticism (TS)

Results

Hypothesis one suggested that the perceived experience of techno-anxiety is positively associated with the gender of educators. As results depicted (Table 2), this relationship was positive and significant (β = 1.054, t = 10.396, p < .05), which indicated the acceptance of H1. Thus, it specifies that techno-anxiety impacts the gender of instructors. Next, testing the relationship between techno-anxiety and educators' age revealed (β = 3.183, t = 20.373, p < .001) statistically significant and supported H2. Therefore, it describes techno-anxiety positively impacting the age of education. Furthermore, the perceived relationship between techno-anxiety and the working experiences of educators was (β = 2.744, t = 16.512, p < .001) statistically positive and significant. Hence, H3 is supported. It signified that those instructors perceived the same techno-anxiety even if they had more working experience.

Hypotheses four proposed the association of techno-fatigue with the gender of lecturers quantified (β = 1.069, t = 10.015, p < .001) statistically significant and positive relationship. Hence, H4 is accepted. Similarly, the perceived experience of techno-fatigue was statistically significant and positive (β = 2.973, t = 17.998, p < .001) associated with the age of educators and accepted H5. However, H6 (β = 2.629, t = 13.929, p = 0.121), which suggested the perceived experience of techno-fatigue is positively associated with the working experiences of educators, was not supported. Therefore, it submits that techno-fatigue has not impacted the instructors due to their working experience.

Table 2. Hypotheses Testing Result

	Gender			Age			Working experience		
Constant	β-values	*t*-values	*p*-values	β-values	*t*-values	*p*-values	β-values	*t*-values	*p*-values
TA ->	1.054	10.396	<.05	3.183	20.373	<.001	2.744	16.512	<.001
TF ->	1.069	10.015	<.001	2.973	17.998	<.001	2.629	13.929	0.121
TS ->	1.567	16.761	<.001	3.269	22.834	<.001	2.678	16.835	<.001
TI ->	1.604	17.896	<.001	2.967	22.289	<.001	2.667	16.974	<.001
Squared Multiple Correlation (R^2):									
Gender: R^2 for TA = 0.033, TF = 0.078, TI = 0.110, TS = 0.110									
Age: R^2 for TA = 0.068, TF = 0.104, TI = 0.204, TS = 0.153									
Working experience: R^2 for TA = 0.117, TF = 0.021, TI = 0.072, TS = 0.125									

Moreover, the perceived experience of techno-skepticism and the gender of educators were found to be a statistically significant and positive association ($\beta = 1.567$, $t = 16.761$, $p < .001$), resulting in the acceptance of H7. Besides, the test of perceived experience of techno-skepticism with the age of educators presented ($\beta = 3.269$, $t = 22.839$, $p < .001$) a significant and positive relationship. Thus, H8 is supported. Similarly, the test of H9 was supported because there was a statistically significant and positive relationship between the perceived experience of techno-skepticism and the working experiences of educators ($\beta = 2.678$, $t = 16.835$, $p < .001$).

Additionally, the proposed perceived experience of techno-inefficacy and the gender of educators depicted a statistically significant and positive association ($\beta = 1.604$, $t = 17.896$, $p < .001$), which supported H10. Also, the test of techno-inefficacy associated with the age of lecturers was found to be positively and statistically significant ($\beta = 2.967$, $t = 22.289$, $p < .001$), resulting in an acceptance of H11. Finally, the perceived experience of techno-inefficacy and the working experiences of educators were statistically significant and positively relationship ($\beta = 2.667$, $t = 16{,}974$, $p < .001$), which supported H12.

Discussion

This work aimed to investigate the impacts of perceived technostress attributes on instructors in Cambodian educational institutions in the context of Covid-19. Whether stress has been researched concerning another characteristic or as an attribute itself, its ubiquity and importance in instructional practices remain unwavering. Technostress affects educators and other professions for several factors. This topic and demand arose because of the study, which looked at the technologies instructors required to use to efficiently carry out their daily work activities, resulting in technostress. The following variables were used to depict the relationship of technostress attributes (anxiety, fatigue, skepticism, and inefficacy) with instructors (gender, age, and working experience).

Gender differences in perceptions of technostress were identified. Since most of those who responded were males, females have been found to experience more technostress generally. Thus, it echoes the previous findings (Syvänen et al., 2016). Because of believing their current teaching job had a substantial and positive impact on how they feel about techno-anxiety, especially the strong tension and anxiety when working with technology. Also, they get fatigued after working with ICT, exhausted from their interactions with them, and lack the energy to do anything else. Equally, they feel doubts when using these technologies, and the view of the contribution of technology to their work is more skeptical. Likewise, they believe they are inefficient when it comes to applying technology. It is consistent with research from the incident, which show that females experience higher amounts of stress (Cao et al., 2020; Qiu et al., 2020; Taylor et al., 2020), who considered the situation was more

difficult than male did (Commodari & La Rosa, 2020; Li et al., 2020), and females have a higher risk perception than males (Harris & Jenkins, 2006). Additionally, females are frequently reported to be more security conscious and vulnerable to technology engagement (Chou & Sun, 2017; Milne et al., 2009; Mohamed & Ahmad, 2012).

The age variable also showed significant disparities. It is important to note that instructors (aged 53–64) had significantly higher mean results for perceived anxiousness and ineffectiveness. Furthermore, the group of instructors (aged 36–52) experienced higher exhaustion and skepticism regarding current technology, and they are uncertain of the usefulness of such competencies. Although this study also aligned empirically that the relationship between individual aging and technological stress appears significant (Şahin & Çoklar, 2009; Tams, 2017), some believed that the converse was correct (Jena & Mahanti, 2014; Tarafdar et al., 2011; Zhou & Salvendy, 2019). However, the findings suggest that the older age group of instructors are more susceptible to technostress than the younger group. This is similar to research indicating that the younger age group is more up to date with contemporary technology and thus less prone to suffer from technostress (Mahalakshmi & Sornam, 2012).

Depending on the nature of relevant work experience, the following variables on technostress qualities were statistically significant. First, instructors with a proven experience of 5–20 years were more likely to believe applying technological tools in the virtual classroom causes them to feel anxious and impacts their teaching. Second, they perceived skepticism about the pace of innovation had caught their attention over time. This is consistent with previous studies indicating that individuals with more job experience had increased technostress (Syvänen et al., 2016). Third, however, they perceived a negative correlation about techno-inefficacy, especially concerning using ICT to complete their work. Alternatively, no significant perceived techno-fatigue was discovered among the working experience group. As a result, they were exhausted after completing their task with ICT and were unable to perform anything else, irrespective of their relevant experience.

Conclusion

This study sheds light on the latent variables that contributed to instructors' perceived technostress during the COVID-19 epidemic, which prompted the switch to virtual classrooms. The results supported all hypotheses and proved the validity of the proposed conceptual model. Although technology is transforming the way individuals work and communicate, online education has yet to embrace technology fully. The progress is slow, and everyone is caught up in ambiguity and issues within the course (Mitchell et al., 2015). Incorporating ICT into teaching and learning indeed has the potential to improve teaching and assessment while also enhancing student accomplishment but doing so requires an increase in the knowledge and abilities required for educators to do so effectively. Therefore, educators are constantly attempting to stay up with the progress of technology while also incorporating pedagogical innovations. They may feel more stressed because of dealing with this owing to the constant need to adjust. Hence, several attributes may lead to COVID-19-related stress, including the significant impact on health and well-being and concerns about job loss because of COVID-19-related constraints, economic woes, and wellness issues. These concerns and anxieties could lead to a lower standard of living and the creation of harmful remedies, especially after the COVID-19 calamity (Achterberg et al., 2021). Equally, public health, economics, and society are at stake if policymakers do not support effective long-term solutions to combat infectious diseases like COVID-19 (Coccia, 2021). In addition, the gap between work and home life might become increasingly blurry for virtual office workers due to their mobility. Accordingly, the strain of working in a virtual office has been permitted to extend from the traditional office, perhaps resulting in fewer social connections and inadequate contact (Okonoda et al., 2017; Stich, 2020).

Finally, it is believed that the findings of this study would provide an avenue for academic institutions to handle technostress. Given the quickly changing ICT trends, developing practical training and wellness programs is appropriate to lower academic stress and build a sense of technological competence and personal significance.

Ethics Statement

Human volunteers did not require ethical review or permission under local legislation and institutional criteria for the study. The questionnaire informed participants not to provide any identification or information in this work. Participants submitted consent to participate in the study after being adequately informed.

Limitations and future work

There are some limitations to this study that should be considered when interpreting the findings. Initially, a focus solely on the education institutions in Cambodia inhibits generalizability, as does the diversity of employment and organizational culture may impede generalization. Thus, future research should contain cross-country analyses and comparisons of technostress practices in different countries. Lastly, considering only quantitative methods are used in the study, it is difficult to make a more profound examination; therefore, qualitative and quantitative approaches should be incorporated in the future research to obtain more details.

Funding: No funds, grants, or other support was received.

Conflicts of Interest: The authors declare no conflict of interest.

References

Achterberg, M., Dobbelaar, S., Boer, O. D., & Crone, E. A. (2021). Perceived stress as mediator for longitudinal effects of the COVID-19 lockdown on wellbeing of parents and children. *Scientific reports*, *11*(1), 1-14.

Agai–Demjaha, T., Minov, J., Stoleski, S., & Zafirova, B. (2015). Stress causing factors among teachers in elementary schools and their relationship with demographic and job characteristics. *Open access Macedonian journal of medical sciences*, *3*(3), 493.

Al-Fudail, M., & Mellar, H. (2008). Investigating teacher stress when using technology. *Computers & Education*, *51*(3), 1103-1110.

Alvites-Huamaní, C. G. (2019). Estrés docente y factores psicosociales en docentes de Latinoamérica, Norteamérica y Europa. *Propósitos y representaciones*, *7*(3), 141-159.

Bartoszko, A. (2020). Accelerating curve of anxiousness: How a governmental quarantine-app feeds society with bugs.

Bondanini, G., Giorgi, G., Ariza-Montes, A., Vega-Muñoz, A., & Andreucci-Annunziata, P. (2020). Technostress dark side of technology in the workplace: A scientometric analysis. *International Journal of Environmental Research and Public Health*, *17*(21), 8013.

Bozionelos, N. (1996). Psychology of computer use: XXXIX. Prevalence of computer anxiety in British managers and professionals. *Psychological reports*, *78*(3), 995-1002.

Bright, L. F., & Logan, K. (2018). Is my fear of missing out (FOMO) causing fatigue? Advertising, social media fatigue, and the implications for consumers and brands. *Internet Research*.

Bryman, A. (2016). *Social research methods*. Oxford university press.

Byrne, B. M. (2010). Multivariate applications series. *Structural equation modeling with AMOS: Basic concepts, applications, and programming (2nd ed.). Routledge/Taylor & Francis Group*.

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry research*, *287*, 112934.

Chou, H.-L., & Sun, J. C.-Y. (2017). The moderating roles of gender and social norms on the relationship between protection motivation and risky online behavior among in-service teachers. *Computers & Education*, *112*, 83-96.

Coccia, M. (2020). An index to quantify environmental risk of exposure to future epidemics of the COVID-19 and similar viral agents: Theory and practice. *Environmental Research*, *191*, 110155.

Coccia, M. (2021). Effects of the spread of COVID-19 on public health of polluted cities: results of the first wave for explaining the dejà vu in the second wave of COVID-19 pandemic and epidemics of future vital agents. *Environmental Science and Pollution Research*, *28*(15), 19147-19154.

Çoklar, A. N., Efilti, E., Sahin, Y. L., & Akçay, A. (2016). Investigation of Techno-Stress Levels of Teachers Who Were Included in Technology Integration Processes. *Online Submission*.

Commodari, E., & La Rosa, V. L. (2020). Adolescents in quarantine during COVID-19 pandemic in Italy: perceived health risk, beliefs, psychological experiences and expectations for the future. *Frontiers in psychology*, *11*, 2480.

Cox, T., Griffiths, A., & Rial-González, E. (2000). *Research on work-related stress*. European Communities.

Dong, Y., Xu, C., Chai, C. S., & Zhai, X. (2020). Exploring the structural relationship among teachers' technostress, technological pedagogical content knowledge (TPACK), computer self-efficacy and school support. *The Asia-Pacific Education Researcher*, *29*(2), 147-157.

Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, *18*(3), 382-388.

Fuglseth, A. M., & Sørebø, Ø. (2014). The effects of technostress within the context of employee use of ICT. *Computers in human behavior*, *40*, 161-170.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate Data Analysis* (7 ed.). Pearson Education Limited.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8 ed.). Cengage Learning.

Harris, C. R., & Jenkins, M. (2006). Gender differences in risk assessment: why do women take fewer risks than men?

Hsiao, K.-L. (2017). Compulsive mobile application usage and technostress: the role of personality traits. *Online Information Review*.

Jena, R., & Mahanti, P. (2014). An empirical study of Technostress among Indian academicians. *International Journal of Education and Learning*, *3*(2), 1-10.

Joo, Y. J., Lim, K. Y., & Kim, N. H. (2016). The effects of secondary teachers' technostress on the intention to use technology in South Korea. *Computers & Education*, *95*, 114-122.

Khan, A., Rehman, H., & Rehman, D. S.-u. (2016). An empirical analysis of correlation between technostress and job satisfaction: A case of KPK, Pakistan. *Pakistan Journal of Information Management and Libraries*, *14*.

Lee, S. B., Lee, S. C., & Suh, Y. H. (2016). Technostress from mobile communication and its impact on quality of life and productivity. *Total Quality Management & Business Excellence*, *27*(7-8), 775-790.

Li, L., & Wang, X. (2021). Technostress inhibitors and creators and their impacts on university teachers' work performance in higher education. *Cognition, Technology & Work*, *23*(2), 315-330.

Li, X., Lv, S., Liu, L., Chen, R., Chen, J., Liang, S., Tang, S., & Zhao, J. (2020). COVID-19 in Guangdong: immediate perceptions and psychological impact on 304,167 college students. *Frontiers in psychology*, *11*.

Mahalakshmi, K., & Sornam, S. A. (2012). Impact of technology on physical and mental health of library professionals in engineering colleges of Anna University, Tamilnadu. 4th International Conference on Computer Research and Development,

Manco-Chavez, J. A., Uribe-Hernandez, Y. C., Buendia-Aparcana, R., Vertiz-Osores, J. J., Isla Alcoser, S. D., & Rengifo-Lozano, R. A. (2020). Integration of ICTS and Digital Skills in Times of the Pandemic COVID-19. *International Journal of Higher Education*, *9*(9), 11-20.

Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First-and higher order factor models and their invariance across groups. *Psychological bulletin*, *97*(3), 562.

Matteucci, N., O'Mahony, M., Robinson, C., & Zwick, T. (2005). Productivity, workplace performance and ICT: Industry and firm-level evidence for Europe and the US. *Scottish Journal of Political Economy*, *52*(3), 359-386.

Milne, G. R., Labrecque, L. I., & Cromer, C. (2009). Toward an understanding of the online consumer's risky behavior and protection practices. *Journal of Consumer Affairs*, *43*(3), 449-473.

Mitchell, L. D., Parlamis, J. D., & Claiborne, S. A. (2015). Overcoming faculty avoidance of online education: From resistance to support to active participation. *Journal of Management Education*, *39*(3), 350-371.

Mohamed, N., & Ahmad, I. H. (2012). Information privacy concerns, antecedents and privacy measure use in social networking sites: Evidence from Malaysia. *Computers in human behavior*, *28*(6), 2366-2375.

Molino, M., Ingusci, E., Signore, F., Manuti, A., Giancaspro, M. L., Russo, V., Zito, M., & Cortese, C. G. (2020). Wellbeing costs of technology use during Covid-19 remote working: An investigation using the Italian translation of the technostress creators scale. *Sustainability*, *12*(15), 5911.

Mondal, J., Shrestha, S., & Bhaila, A. (2011). School teachers: Job stress and job satisfaction, Kaski, Nepal. *International Journal of Occupational Safety and Health*, *1*(1), 27-33.

Okebaram, & Moses, S. (2013). Minimizing the effects of technostress in today's organization. *International Journal of Emerging Technology and Advanced Engineering*, *3*(11), 649-658.

Okonoda, K., Tagurum, Y., Imo, C., Nwachukwu, V., Okoli, E., & James, B. (2017). Prevalence and correlates of technostress among academic staff at the University of Jos, Nigeria. *Journal of Medical Science And Clinical Research*, *5*(3), 18616-18624.

Penado Abilleira, M., Rodicio-García, M.-L., Ríos-de Deus, M. P., & Mosquera-González, M. J. (2021). Technostress in Spanish University Teachers During the COVID-19 Pandemic. *Frontiers in psychology*, *12*, 496.

Penado Abilleira, M., Rodicio-García, M. L., Ríos-de-Deus, M. P., & Mosquera-González, M. J. (2020). Technostress in Spanish university students: validation of a measurement scale. *Frontiers in psychology*, *11*, 2602.

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General psychiatry*, *33*(2).

Rowden, R. W. (2005). The impact of workplace learning on job satisfaction in small US commercial banks. *The Journal of Workplace Learning*, *17*(4), 215-230.

Şahin, Y. L., & Çoklar, A. N. (2009). Social networking users' views on technology and the determination of technostress levels. *Procedia-Social and Behavioral Sciences*, *1*(1), 1437-1442.

Salanova, M., Llorens, S., & Cifre, E. (2013). The dark side of technologies: Technostress among users of information and communication technologies. *International journal of psychology*, *48*(3), 422-436.

Salanova, M., Llorens, S., & Ventura, M. (2011). Guía de Intervención Tecnoestrés. *Editorial Síntesis*, 25-26.

Salo, J., Mäntymäki, M., & Islam, A. N. (2018). The dark side of social media–and Fifty Shades of Grey introduction to the special issue: the dark side of social media. *Internet Research*.

Smith, J. (2016). *Here's why workplace stress is costing employers $300 billion a year*. Businessinsider. Retrieved September 01, 2021 from https://www.businessinsider.com/how-stress-at-work-is-costing-employers-300-billion-a-year-2016-6

Stich, J.-F. (2020). A review of workplace stress in the virtual office. *Intelligent Buildings International*, *12*(3), 208-220.

Syvänen, A., Mäkiniemi, J.-P., Syrjä, S., Heikkilä-Tammi, K., & Viteli, J. (2016). When does the educational use of ICT become a source of technostress for Finnish teachers? Seminar. net,

Tams, S. (2017). A refined examination of worker age and stress: explaining how, and why, older workers are especially techno-stressed in the interruption age. In *Information systems and neuroscience* (pp. 175-183). Springer.

Tarafdar, M., Pullins, E. B., & Ragu-Nathan, T. (2015). Technostress: negative effect on performance and possible mitigations. *Information Systems Journal*, *25*(2), 103-132.

Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. (2007). The impact of technostress on role stress and productivity. *Journal of management information systems*, *24*(1), 301-328.

Tarafdar, M., Tu, Q., Ragu-Nathan, T., & Ragu-Nathan, B. S. (2011). Crossing to the dark side: examining creators, outcomes, and inhibitors of technostress. *Communications of the ACM*, *54*(9), 113-120.

Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., & Asmundson, G. J. (2020). COVID stress syndrome: Concept, structure, and correlates. *Depression and anxiety*, *37*(8), 706-714.

Tu, Q., Wang, K., & Shu, Q. (2005). Computer-related technostress in China. *Communications of the ACM*, *48*(4), 77-81.

von der Embse, N., Ryan, S. V., Gibbs, T., & Mankin, A. (2019). Teacher stress interventions: A systematic review. *Psychology in the Schools*, *56*(8), 1328-1343.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020a). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, *17*(5), 1729.

Wang, K., Shu, Q., & Tu, Q. (2008). Technostress under different organizational environments: An empirical investigation. *Computers in human behavior*, *24*(6), 3002-3013.

Wang, X., Tan, S. C., & Li, L. (2020b). Measuring university students' technostress in technology-enhanced learning: Scale development and validation. *Australasian Journal of Educational Technology*, *36*(4), 96-112.

World Health Organization. (2021). *WHO Coronavirus (COVID-19) Dashboard*. Retrieved October 20, 2021 from https://covid19.who.int/?gclid=CjwKCAiArIH_BRB2EiwALfbH1KspWn5No8D8gIHawC

Yuen, A. H., & Ma, W. W. (2008). Exploring teacher acceptance of e-learning technology. *Asia-Pacific Journal of Teacher Education*, *36*(3), 229-243.

Zhou, J., & Salvendy, G. (2019). *Human Aspects of IT for the Aged Population. Social Media, Games and Assistive Environments: 5th International Conference, ITAP 2019, Held as Part of the 21st HCI International Conference, HCII 2019, Orlando, FL, USA, July 26-31, 2019, Proceedings, Part II* (Vol. 11593). Springer.

SEISENSE Journal of Management
Vol 5 No 1 (2022): DOI: https://doi.org/10.33215/sjom.v5i1.804 , 72-86
Research Article

Relationship Between Strategic Direction, Core Competencies And Firm Competitiveness Among Manufacturing Firms In Uganda

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Article History
Received 2022-04-15
Revised 2022-07-22
Revised 2022-08-15
Accepted 2022-08-16
Published 2022-09-01

Keywords
Firm competitiveness
Strategic direction
Core competencies
Strategic leadership

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Abstract

Purpose- The paper examines the relationship between strategic direction, core competencies, and firm competitiveness among manufacturing firms in Uganda.

Design/Methodology- This study collected quantitative data from 410 manufacturing firms using self-administered questionnaires, while qualitative data was collected from 10 manufacturing firms using an interview guide. Quantitative data were augmented by qualitative methods, allowing us to comprehend the phenomenon under study completely. To study the nature of reality, an explanatory cross-sectional survey was employed. While the content analysis was used to investigate qualitative data, regression analysis was used to evaluate hypotheses.

Findings- According to the research, a firm's competitiveness improves when its executives concentrate on their capabilities. The findings validated the theoretical foundations of the resource-based viewpoint.

Practical Implications- As a result of the findings, manufacturing firms may increase strategic leadership's influence on competitiveness by ensuring that workers have proper directions and that the core competencies are identified and leveraged to ensure efficiency and effectiveness in operations. The findings may assist CEOs and policymakers design strategies and policies to increase the level of competitiveness of their firms.

Introduction

Researchers in strategic management and economics have characterized the idea of competitiveness as a complicated, diverse, and relative term whose relevance varies depending on the period and environment in which it is encountered (Chaudhuri *et al.,* 1997; Schulz & Flanigan, 2016). Academics from several disciplines have attempted to understand competition from various approaches. Despite a considerable amount of information and literature on firm competitiveness, scholars have been baffled by the idea (Chaudhuri *et al.,* 1997). Even though scholars have differing opinions on the term's definition, the concept of firm competitiveness has come to be connected with a company's financial strength in general (S. Srivastava *et al.*, 2017). Gaining a competitive advantage over other manufacturing companies has become a new goal for companies worldwide to boost their output and profitability (Ajitabh & Momaya, 2003). Ugandan manufacturing, in particular, requires expansion since the country's demand for manufactured goods is enormous, providing additional opportunities for the country's manufacturers. Uganda imports up to 70% of its manufactured product requirements from other countries (Anderson & van der Mensbrugghe, 2007), demonstrating that the country has low manufacturing levels. As a result of the scenario, Uganda lost up to 1,122.9 million US dollars in manufactured goods imports in 2019 (UBOS, 2020).

The big potential for Uganda's manufacturing industry is to develop deeper, more dynamic, and stronger forward and backward ties, not just within the manufacturing sector but also with other sectors (Nagaaba, 2020). Uganda's geographical location in Eastern and Southern Africa gives it a competitive advantage in terms of potential buyers for its manufactured goods in surrounding nations. On the other hand, Uganda is a landlocked country that relies largely on Kenya and Tanzania for access to seaports for its import and export commodities and services. Despite its vast potential, Uganda's manufacturing sector has seen very modest growth over the years, with its proportionate share of total GDP falling from 6.6 percent in 2016 to 3.4 percent in 2019 (Golooba-mutebi, 2019). In 2020, the sector's growth rate was 1.6 percent, down from 7.1 percent in 2018. This contrasts with Vision 2040's prediction of the industry's 10.4% annual growth rate. Apart from that, it contrasts negatively with regional economies such as Kenya and Tanzania, which had sector growth of more than 10.2% and 7.9%, respectively, from 2018 to 2020 (World Bank report, 2020). Uganda's manufacturing sector has grown slowly compared to its neighbors, and as a result, the industry has become less competitive on national, regional, and international levels (Golooba-mutebi, 2019).

According to Chandra (2016), the operations of most manufacturing firms in India are inferior to those of their worldwide counterparts due to expensive capital expenditures, strict labor laws, and the country's small local market. Several hurdles, such as stiff competition from larger organizations and multinationals, poor worker performance, and restricted access to resources and markets, have influenced Uganda's manufacturing enterprises' competitiveness, among other things (Ecuru *et al.,* 2015). According to Olaka *et al.,* (2017), most businesses, particularly industrial enterprises, have seen their competitive edge erode as a consequence of complexity, inadequate strategic leadership, and an unpredictable business climate. These issues have harmed the competitiveness of Ugandan manufacturing businesses in terms of survival and expansion. As a result, 101 manufacturing companies in the country closed businesses between 2018 and 2020 (Public, 2020). To address these difficulties, Uganda's government has advocated for infrastructure improvements and incentives for those who engage in the industrial sector through its policy framework. Experts agree that strategic leadership improves a company's ability to compete (Egwakhe & Adeoye, 2019; Shrestha, 2019; Adebayo & Mudashiru, 2019). The elements of strategic leadership that influenced firm competitiveness were; strategic direction and core competence. Strategic direction in this study is understood as the foundational ideas or actions that allow for greater consistency in strategy over time. According to Akenten (2019), a company's strategic direction aids in foresight, encourages employees to do more than they think, and strengthens the company's competitiveness by allowing for massive change and progress. According to Agha et al., (2011), who define core competence as

"what distinguishes an organization from its surroundings," this aspect of strategic leadership impacts a business's capacity to compete. Academics have also defined core competence as the ability to succeed in an organizational environment or adjust to novel circumstances (Chen & Wu, 2007). Core competencies, as defined by S. C. Srivastava (2005), are an organization's unique abilities to diagnose and address problems. According to Hafeez (2002), an organization's competitive advantage may be directly correlated to its core competencies. Strategic leadership attributes and their impact on a firm's capacity to compete in its industry have received little attention from academics (Kamya & Ntayi, 2011). Research on the link between a company's strategic direction, core competencies, and competitiveness has received considerable attention. This study would contribute to the literature by examining how Ugandan manufacturers' strategic direction and core competence influence their capacity to compete.

Literature Review

In competitive studies, Penrose's Resource Based View, first proposed in 1959 and then refined by others, is a novel concept (Takiguchi, 2000). According to the principle, companies can utilize their resources to become more competitive. A resource is a scarce and irreplaceable asset, experience, organizational process, piece of information, or set of skills (Le et al., 2020). However, owning these resources is insufficient (Mohammed & Rugami, 2019). According to Khan et al., (2019), enterprises must successfully manage their distinctive resources and abilities to develop a competitive advantage and generate value relative to market rivals.

Due to disparities in data processing methodologies and situational depictions of strategic leadership, scholarly results on the relationship between strategic leadership and firm competitiveness vary substantially (Adebayo & Mudashiru, 2019). Further, in order to increase competitiveness, Agwu (2018) emphasized the significance of consistent leadership techniques across all of an organization's resources. Consequently, strategic leadership is organically linked to improved firm competitiveness and overall performance. The study also indicated that the personality traits of a company's strategic executives had a significant impact on its competitiveness. In order to increase competitiveness, Mahdi & Almsafir (2014), argue that it is beneficial to invest in risk-tolerant human capital. In contrast, Díaz-Chao et al., (2016) discovered that decision making adversely correlated with a company's competitive advantage.

Additionally, empirical research conducted by scholars such as Adebayo & Mudashiru (2019), Jaleha & Machuki, (2018), Kim & Thapa, (2018), Banmore *et al.*, (2019) discovered that strategic leadership has a beneficial influence on business competitiveness. Researchers that investigated at the association between strategic leadership and competitiveness in the service industry as a whole (Andersson *et al.*, 2014; Wang *et al.*, 2011; G. Wang *et al.,* 2016; Adeoye, 2019) found that it was positive and statistically significant. Additionally, the studies cited above imply that some leadership abilities enhance strategic leadership, hence increasing a firm's competitiveness. This fits with the findings of the upper echelons theory, which has stimulated research into the manner by which the personalities and backgrounds of business leaders affect the decisions they make and the results their companies achieve (e.g., Bromiley, 2016; Markoczy, 2015 G. Wang *et al.*, 2016). Hambrick (2007) avers that strategic leaders' experiences, values and personalities affect their choices and through these choices, firm competitiveness is boosted. According to Hambrick & Mason (1984), "the upper echelons hypothesis is one of the most widely accepted schools of thought in the field of strategic management". In their study, Hitt et al., (2010) created a strategic leadership model based on six important aspects to explain how strategic leadership affects firm-level competitiveness. These include defining strategic direction, building human capital, exploiting and retaining key competencies, keeping an effective business culture, stressing ethical behavior, and establishing strategic control (Akenten, 2019). According to Akenten (2019), these aspects interact, demonstrating that strategic leaders' combination of these characteristics results in an improvement in firm competitiveness. To effectively manage an organization's resources, one must, for example, cultivate human capital that aids in defining a strategic course of action, sustaining a positive corporate culture,

implementing reliable control procedures, establishing a code of ethics, and discovering and developing essential skills and abilities. (Akenten, 2019).

Instead of the above, Chief Executive Officers (CEOs) are entirely responsible for deciding their businesses' strategic direction (Hitt *et al.,* 2010), which is defined as the process of developing a long-term vision of a firm's strategic aim (Hitt *et al.,* 2010; Rotemberg *et al*., 2016). According to Prahalad & Hamel (1994), strategic intent is utilizing a business's internal resources, talents, and core competencies to enable a firm to achieve what may appear to be an unreachable objective in an unpredictable competitive environment. While Akenten (2019) stated that strategic purpose exists in organizations when all workers are dedicated to achieving a particular performance metric, believe passionately in their product and industry, and concentrate solely on what they do better than rivals. Strategic intent inspires employees to strive beyond their expectations of success by assisting them in imagining the future, which raises the degree of business competitiveness since substantial change and development are attained (Akenten, (2019).

Furthermore, Hitt *et al.,* (2010) argue that strategic leaders must strive relentlessly to apply core capabilities to enhance company performance and, as a result, boost firm-level competitiveness. Jaleha & Machuki (2018) must make decisions to assist their organization in creating, preserving, enhancing, leveraging, and exploiting key capabilities through pooling resources across the firm's many units. These core competencies thrive when they are founded on intangible resources that are not readily obvious to competitors, such as the knowledge or skills of certain persons (Akenten, 2019). Core competencies are effectively utilized in many big and undoubtedly diverse organizations when established and deployed across different parts of the organization to create and maintain a competitive advantage in the marketplace (Nicholson & Howard, 2018). They said that developing, cultivating, and applying core competencies for many multinational organizations makes it easier to manage complicated connections among enterprises operating in many worldwide marketplaces.

On the other hand, core skills cannot function effectively without good human and social capital development. Following the evaluation of the literature, this study will attempt to fill in the gaps by examining how different characteristics of strategic leadership impact company competitiveness in Uganda. This leads us to postulate the following;

H1: Strategic direction has a significant effect on firm competitiveness.

H2: Core competencies have a significant effect on firm competitiveness.

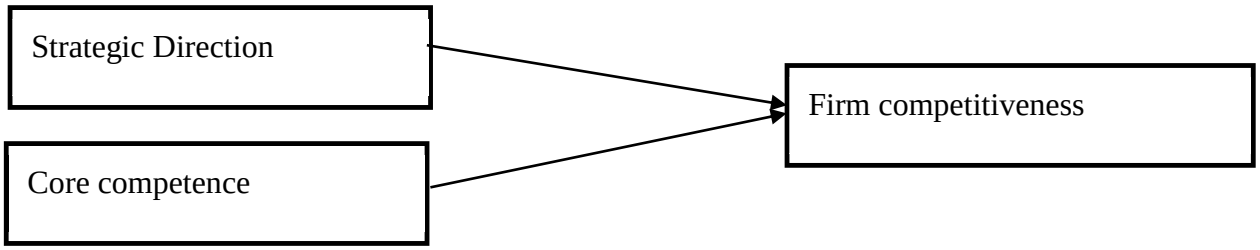

Figure 1 - Conceptual framework

As seen in the figure above, strategic direction and core competence as elements of strategic leadership were modeled with firm competitiveness as the dependent variable. We suggest that strategic direction and core competence are significant determinants of firm competitiveness, i.e., clear strategic directions and more core competencies lead to higher firm competitiveness levels. For manufacturing firms to maintain high levels of competitiveness, they should improve their core competencies and give clear directions to workers of their firms.

Methodology

Research design and sample

To investigate the link between strategic direction, core competencies, and firm competitiveness, the researchers used a cross-sectional explanatory survey methodology that blended qualitative and quantitative research methodologies. Manufacturing companies in Uganda served as the study's unit of analysis. Based on Taherdoost (2017) sample size determination table, out of the population of 1,324 manufacturing firms registered with the Uganda Manufacturers' Association, a sample of 624 firms was taken. There was a 65.7% response rate, with 410 manufacturing firms providing the necessary quantitative data. The quantitative data was supplemented with qualitative data obtained from 10 manufacturing firms with the help of an interview guide. This also enabled us to understand the phenomena that were being studied fully.

Measurement of variables

Dependent variable: The competitiveness of firms was measured using scales devised by Li *et al.*, (2006).

Independent variables: Strategic direction and core competencies were evaluated using a tool devised by Ireland & Hitt (1999) and experimentally tested by Serfontein (2010) and Jooste & Fourie (2009).

Control variables: The number of years a company has existed was used as a proxy for its "age" (Philippon, 2018). At the same time, the number of workers was used as a proxy for firm size (Revilla & Fernández, 2013).

All responses were recorded on a 7-point Likert scale, with 1 indicating "strongly disagree" and 7 indicating "strongly agree," or "far worse than competitors" (1) and "far better than competitors" (7). Since most of the early authors used a seven-point Likert scale to assess the psychometric properties of the variables, it was assumed to be the most applicable and reliable option.

Data entry, editing, and reliability analysis

The study used SPSS version 23 & NVIVO version 11 pro to analyze quantitative and qualitative data. Input errors, missing values, outliers, and normality were checked in SPSS once the quantitative data from the field was entered into the software. Unusable data was found to be at 0.1 percent, within the 0.5 percent rule of thumb (Hadi *et al.*, 2009). The data were evaluated for normality assumptions and a normal distribution pattern was identified. As Chun Won et al., (2017) suggested, the linearity of the predictor variable and the explanatory elements was also assessed using scatter plots of the standardized residuals of the dependent and independent variables. The data was then tested for homoscedasticity, and the result showed that the data was homoscedastic since all of the test statistic values had a level of significance of more than 5% (p-value >.05). In addition, the VIF values were less than ten and the tolerance level was larger than 0.10, suggesting that there was no multi-collinearity. The Durbin-Watson value of 1.75 was achieved in serial correlation testing, indicating that there was no serial correlation since the result was within the 1.5 to 2.5 range recommended by the authors (Savin & White, 1977).

Results

Confirmatory factor analysis for firm competitiveness

Firm competitiveness was measured in terms of quality, time to market, Price, product innovation, and delivery dependability. All the 3 items from exploratory factor analysis under quality as a dimension survived. Confirmatory factor analysis confirmed and retained all the 3 items from exploratory factor analysis from delivery dependability. All the items for product dependability were retained after conducting confirmatory factor analysis, while under time to market one item was eliminated due to low loading. Results from the fit indices for the measurement model were satisfactory (Hu & Bentler, 1999), indicating that the items measuring

company competitiveness were sufficiently represented after confirmatory factor analysis. Results from the confirmatory factor analysis for firm competitiveness are indicated in the table below;

Table 1: Model fit measures of confirmatory factor analysis for firm competitiveness

Measure	Estimate	Threshold	Interpretation
CMINCMIN	177.603	--	--
DF	78	--	--
CMIN/DF	2.277	Between 1 and 3	Excellent
CFI	0.966	>0.95	Excellent
SRMR	0.060	<0.08	Excellent
RMSEA	0.056	<0.06	Excellent
PClose	0.179	>0.05	Excellent

Key: CFI: Comparative factor index, RMSEA: Root mean square of error approximation, CMIN/DF: Minimum Discrepancy Function by Degrees of Freedom divided, SRMR: Standard root mean squared residual

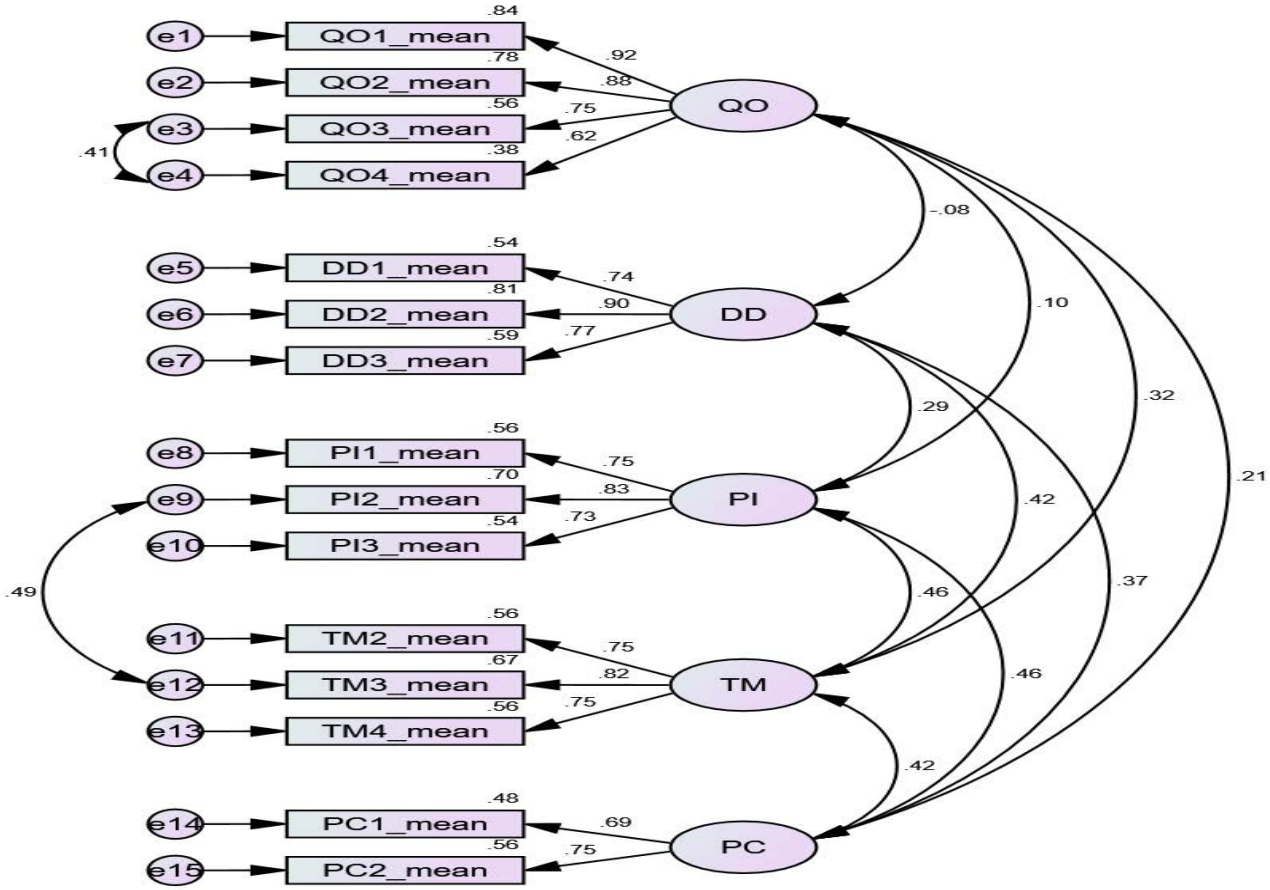

Figure 2- Confirmatory factor analysis for firm competitiveness

Confirmatory Factor Analysis For Strategic Leadership Elements

The results of this measurement model for strategic leadership elements achieved the required indices representing good fit (Mishra, 2016). In general, the provided indices suggest that a reasonable measurement model fit was also obtained for the various indices used to represent strategic leadership, as seen in table 2 below.

Table 2: Model fit measures of confirmatory factor analysis for the elements of strategic leadership

Measure	Estimate	Threshold	Interpretation
CMIN	105.393	--	--
DF	28	--	--
CMIN/DF	3.764	Between 1 and 3	Acceptable
CFI	0.958	>0.95	Excellent
SRMR	0.057	<0.08	Excellent
RMSEA	0.071	<0.06	Acceptable
PClose	0.001	>0.05	Terrible

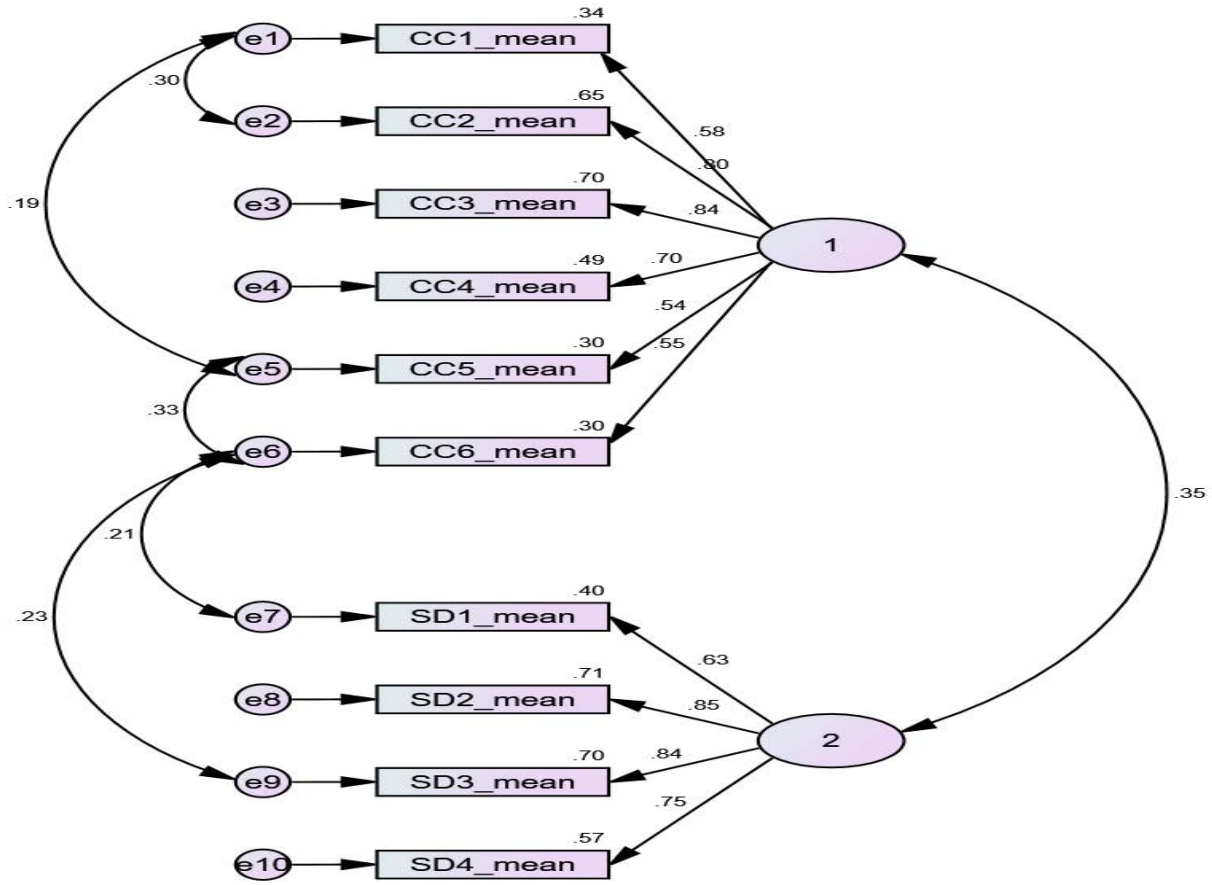

Figure 3 - Confirmatory factor analysis for strategic leadership elements

Descriptive Statistics

The descriptive statistics (mean, standard deviation, and correlations) are shown in Table 3. As shown in the table below, all the variables positively correlated with one another and firm competitiveness (strategic direction r = 0.562, p-value < .05, core competences r = 0.505, p-value < .05) with the exception of the control variables; firm size (r = 0.137, p-value < .05) and firm age (r = 0.027, p-value < .05) which reported low positive correlations. The statistics also indicate that the mean for the category of core competencies was 5.3837, with a standard deviation of 0.79053, while the mean for the domain of strategic direction was 5.1677, with a standard deviation of 1.00035.

Table 3: Descriptive statistics

	Variables	1	2	3	4	5	Mean	SD
1	FC	1					5.3786	.61061
2	SD	.562**	1				5.1677	1.00035
3	CC	.505**	.339**	1			5.3837	.79053
4	Firm size	.137**	.056	.004	1		5.8171	.49269
5	Firm age	.027	.022	-.002	.021	1	4.6683	.74152

****. Correlation is significant at the 0.01 level (2-tailed).**

Key: FC - Firm competitiveness, SD - Strategic direction, CC - Core competences

Testing For The Effect Of Control Variables On The Dependent Variable

Control variables were examined for their influence on the dependent variable to determine how the controls affected the dependent variable in comparison to the direct effects (Creswell & Garrett, 2008). According to Table 4, firm age and size predict a 2% variance in firm competitiveness (R2 = 0.02). The combined prediction is significant, as evidenced by the F value (4.23, P 0.05). Only firm size substantially predicted business competitiveness independently. The coefficients are not causal because they are merely control variables.

Table 4: Control variables effect on the dependent variable

Model	Beta	Unstd.	Std. Error	Beta Std.	t.	Sig.
(Constant)	4.277		.396		10.804	.000
Firm Size	.173		.060	.140	2.865	.004
Firm Age	.020		.040	.024	.493	.622
Model summary statistics						
R				.142		
R square				.02		
Adjusted R square				.60		
Standard error of the estimate						
Change statistics	R square change			.020		
	F change			4.23		
	Sig.			.015		

a. Predictors: (Constant), Firm Size, Firm Age

Source: *Survey data, 2022*

Test Of Hypotheses

H1: Strategic direction has no significant effect on firm competitiveness.

Strategic direction significantly affects a firm's capacity to compete in the market (=0.265, t-value =10.969, p.0005). These results indicate that with each unit increase in strategic direction, firm competitiveness increases by 0.27 units. The findings verify that strategic direction positively affects a company's ability to compete in the market. Therefore, hypothesis H_1 was accepted.

H2: Core competencies have no significant effect on firm competitiveness.

The results revealed that core competencies have a statistically significant effect on firm competitiveness (β =0.276, t-value =9.031, p .000, which is <.*05*). These results indicate that with each unit increases in core competencies, firm competitiveness increases by 0.28 units. The findings verify the concept that a firm's core competencies significantly contribute to its level of competitiveness. Therefore, hypothesis H_2 was accepted.

Table 5: Hierarchical Regression for direct effect relationship

Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.301	.399		10.786	.000
	Firm size	.170	.061	.137	2.787	.006
	Firm age	.020	.040	.024	.484	.629
2	(Constant)	1.663	.343		4.851	.000
	Firm size	.138	.046	.111	2.985	.003
	Firm age	.013	.031	.015	.414	.679
	Strategic Direction	.265	.024	.434	10.969	.000
	Core Competences	.276	.031	.357	9.031	.000

Model Summary

				Std. Error		Change Statistics			
Model	R	R Square	Adjusted R Square	of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.139[a]	.019	.015	.60613	.019	4.030	2	407	.018
2	.663[b]	.440	.434	.45921	.421	152.043	2	405	.000

a. Predictors: (Constant), Firm age, Firm size

b. Predictors: (Constant), Firm age, Firm size, Core competencies, Strategic Direction

Dependent Variable: Firm competitiveness

Source: Survey data, 2022

Discussion

This section presents a discussion of the findings. It is based on emerging themes and critical incidents that address the stated hypotheses. The researchers combined quantitative and qualitative findings to bring out the social reality of strategic direction, core competencies and firm competitiveness. The discussion is based on two hypotheses:

H1 Strategic direction has no significant effect on firm competitiveness among manufacturing firms in Uganda

This research shows that setting a clear strategic path helps businesses stay competitive. This research shows that organizations' plans are effectively conveyed, and as a result, the necessary knowledge and abilities of employees may be more easily determined. When new organizational plans call for personnel adjustments,

employees are often amenable to making them. Vignette 1 demonstrates how strategic direction may help manufacturing companies stay competitive.

Vignette 1: Clear directions help in improving the level of competitiveness

> The informants indicated that, when leaders give directions like setting of targets to be achieved on a monthly or weekly basis, workers are pushed to work hard to achieve the set targets. This results to the firm producing more and even selling more of the products hence, gaining more profits.

Vignette 1 demonstrates that when firms set clear directions, the level of competitiveness of such firms improves.

The findings of this study are compatible with those of Akenten (2019), who believes that having a strategic direction helps you anticipate the future, drives you to meet your own high success criteria and makes your organization more competitive. However, in the absence of the aforementioned, CEOs have exclusive responsibility for determining the companies' strategic direction, which Hitt *et al.,* (2010) described as the process through which a company creates a long-term vision of its strategic goal. Resource-based theory lends credence to the results of the present investigation. The theory suggests that a company may get an edge in the market by developing resources and skills that are rare, highly sought after, and difficult to replicate by competitors (Baark *et al*., 2011). Multiple sources, including Takiguchi (2000), Barney (2001), and Proponents of the resource-based view, argue that rather than investing in brand-new capabilities for every opportunity, organizations would be better served by finding creative ways to repurpose existing ones (Nafula & Ku, 2017).

H2 Core competencies have no significant effect on firm competitiveness among manufacturing firms in Uganda

According to the study, core competency, as an element of strategic leadership, was also indicated as a way to boost firm competitiveness. In business, "core competence" refers to the well-honed combination of various assets and skills that sets an organization apart from its competitors. Companies need to focus on developing their distinctive strengths to remain competitive in the long run. Core competencies are essential attributes that contribute to a company's future success and may be used in various contexts and strategies. According to the findings of this study, manufacturing businesses' core competence must satisfy the following criteria:

a) **Customer Value**: A key competency must contribute significantly to the customer's perception of value.
b) **Competitor Differentiation**: A manufacturing firm's level of competence cannot be characterized as core unless it is superior to all of its competitors and impossible to copy.
c) **Extensibility:** Within a manufacturing firm, the skill must be able to be applied to new product areas.

Vignette 2 explains core competence and its relevance in improving the level of competitiveness among manufacturing firms

> The informants indicated that, core competences such as skilled personnel, working as a team, experienced team and rewards given to the sales team makes firms to be more efficient in terms of what they do. Also, working as a team increases the speed of work and this implies that we reach our customers faster than the competitors. All these makes firms to be more competitive since the workers are more motivated and committed to their work.

Vignette 2: Core competencies help in improving the level of competitiveness.

Vignette 2 demonstrates that core competencies such as skilled personnel, rewards given to staff, and possession of experienced workers improve on the level of competitiveness.

In light of these findings, experts such as Hafeez (2002) and Gupta *et al.,* (2009) concluded that a firm's core competencies are the foundation of its ability to compete in the market successfully. Moreover, S. C. Srivastava (2005) contends that a company's competitive advantage may be connected to its core competencies. Jerab *et al.,* (2012), identified a positive relationship between a company's core competencies and its levels of competitiveness, which is supported by these findings. Firms with a competitive edge will eventually have higher performance due to this advantage. Moreover, the resource-based perspective theory lends greater credence to the conclusions of this research. According to the RBV hypothesis, a firm's special resources enable it to achieve abnormal returns/profits and to maintain a sustainable competitive edge over its competitors (Peteraf, 1993). In RBV, the major focus is on how businesses identify and use their distinctive assets and competencies to increase their profitability and solidify their positions as market leaders (Madhani, 2010; Wernerfelt, 1984; .

Conclusion

This research aimed to see how the strategic direction and core competencies affect the degree of competitiveness among Ugandan manufacturing companies. By quantifying the extent to which strategic leadership attributes affect a firm's competitiveness, this research contributes significantly to the body of strategic management literature. The study looked into, among other things, the link between strategic direction and firm competitiveness, as well as the relationship between core competencies and firm competitiveness among Ugandan manufacturing firms. The researchers came to the following conclusions from the study's findings. The findings first show that a firm's strategic direction positively and significantly affects its level of competitiveness.

In conclusion, the study reveals that developing clear strategic directions in a strategic plan ensures that people will perform more efficiently with defined goals. At the same time, top-level stakeholders will maintain faith in the firm's potential to achieve long-term success. This enables a firm to advance more quickly and effectively than its competitors, hence increasing the organization's competitiveness. Secondly, the research found that a company's core competencies positively and statistically significantly affect its competitiveness. As a result, the study concludes that if businesses want to improve their competitiveness, they must identify and capitalize on critical capabilities, including ensuring high-quality items, introducing innovative technology, and delivering excellent customer service.

Funding: This research received no external funding as all that was required during the data collection and any other related expenses were met by the Authors.

Acknowledgments: The work benefited much from the comments and suggestions of reviewers at SEISENSE journal of management, and the authors are grateful to them for their time and effort. Tirisa Bonaneri Caroline, a fellow researcher, is also acknowledged for her participation and contributions.

Conflicts of Interest: The authors state that publishing this work does not involve any conflicts of interest on their part.

References

Adebayo, L., & Mudashiru, M. (2019). *Effect of Strategic Leadership on Competitive Advanta g e of Selected Quoted Insurance Companies in Nigeria*. *9*(2), 70–78.

Adeoye, I. A. (2019). Purpose: The relationship between strategic leadership and organisational performance of selected service firms in Lagos and Ogun States, Nigeria. IOSR Journal Of Humanities And Social

Science (IOSR-JHSS, 24(4). https://doi.org/10.9790/0837-2404020106
Agha, S., Alrubaiee, L., & Jamhour, M. (2011). Effect of Core Competence on Competitive Advantage and Organizational Performance. International Journal of Business and Management, 7(1), 192–205. https://doi.org/10.5539/ijbm.v7n1p192
Agwu. (2018). Analysis of the Impact of Strategic Management on the Business Performance. Pan-Atlantic University, 17(1), 1–20.
Ajitabh, A., & Momaya, K. (2003). Competitiveness of Firms: Review of Theory, Frameworks and Models. Singapore Management Review, 26(1), 45–61.
Akenten, W. N. (2019). Strategic Leadership and Why is it is Critical for Businesses / Organizations in РОЗДІЛ 3 Економіка підприємства та організація виробництва Strategic Leadership and Why is it is Critical for Businesses / Organizations in Ghana. April.
Andersson, J., Zbirenko, A., & Medina, A. (2014). Effect of organizational structure, leadership and communication on efficiency and productivity-A qualitative study of a public health-care organization. 71. https://www.diva-portal.org/smash/get/diva2:735889/fulltext01.pdf
Anderson, K., & van der Mensbrugghe, D. (2007). Effects of multilateral and preferential trade policy reform in Africa: The case of Uganda. Journal of International Trade and Economic Development, 16(4), 529–550. https://doi.org/10.1080/09638190701600264
Baark et al., 2011. (2011). Innovation Sources, Capabilities and Competitiveness: Evidence from Hong Kong Firms By Erik Baark. April 2015, 1–40.
Banmore, O. O., Adebayo, L., Mudashiru, M., Oluwatooyin, G., Falilat, A., & Olufunke, O. (2019). Effect Of Strategic Leadership On Competitive Advantage Of Selected Quoted Insurance Companies In Nigeria. The Journal of Accounting and Management, 9(2), 70–78. https://search.proquest.com/docview/2319823102?accountid=32819
Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. Journal of Management, 27(6), 643–650. https://doi.org/10.1177/014920630102700602
Bromiley, P. (2016). Towards a Practice Based View of Strategy. 4(1), 1–23.
Chandra, P. (2016). Competitiveness of Indian Manufacturing : Findings of the Third National Manufacturing Survey 2009 Competitiveness of Indian Manufacturing : Findings of the Third National Manufacturing Survey by : Professor of Operations & Technology Management and India. February. https://doi.org/10.13140/RG.2.1.1786.2166
Chaudhuri, S., Ray, S., & Ray, S. (1997). The Competitiveness Conundrum : Literature Review and Reflections The Competitiveness Conuncdrum. 32(48).
Chen, Y. F., & Wu, T. C. (2007). An empirical analysis of core competence for high-tech firms and traditional manufacturers. Journal of Management Development, 26(2), 159–168. https://doi.org/10.1108/02621710710726062
Chun Won, N., Yen Wan, C., & Yazam Sharif, M. (2017). International Review of Management and Marketing Effect of Leadership Styles, Social Capital, and Social Entrepreneurship on Organizational Effectiveness of Social Welfare Organization in Malaysia: Data Screening and Preliminary Analysis. International Review of Management and Marketing, 7(2), 117–122.
Creswell, J. W., & Garrett, A. L. (2008). The " movement " of mixed methods research and the role of educators. 28, 321–333.
Díaz-Chao, Á., Sainz-González, J., & Torrent-Sellens, J. (2016). The competitiveness of small network-firm: A practical tool. Journal of Business Research, 69(5), 1769–1774. https://doi.org/10.1016/j.jbusres.2015.10.053
Ecuru, J., Lating, P. O., & Trojer, L. (2015). Innovation characteristics of formal manufacturing firms in Uganda. 1338. https://doi.org/10.1080/20421338.2014.970434

Egwakhe, J. A., & Adeoye, I. (2019). Strategic Leadership Dimensions and Competitive Advantage : Perspective of Service Firms in Lagos and Ogun States , Nigeria Strategic Leadership Dimensions and Competitive Advantage : Perspective of Service Firms in Lagos and Ogun States , Nigeria. May.

Golooba-mutebi, F. (2019). An assessment of the policy framework Linda Calabrese , Frederick Golooba - Mutebi and Maximiliano Mendez - Parra. May 2020. https://doi.org/10.13140/RG.2.2.24594.89285

Gupta, S., Woodside, A., Dubelaar, C., & Bradmore, D. (2009). Industrial Marketing Management Diffusing knowledge-based core competencies for leveraging innovation strategies : Modelling outsourcing to knowledge process organizations (KPOs) in pharmaceutical networks. 38, 219–227. https://doi.org/10.1016/j.indmarman.2008.12.010

Hadi, A. S., Rahmatullah Imon, A. H. M., & Werner, M. (2009). Detection of outliers. Wiley Interdisciplinary Reviews: Computational Statistics, 1(1), 57–70. https://doi.org/10.1002/wics.6

Hafeez, K. (2002). Core competence for sustainable competitive advantage : a structured methodology for identifying core competence Core Competence for Sustainable Competitive Advantage : A Structured Methodology for Identifying Core Competence.

Hambrick, D. C. (2007). Upper Echelons Theory: An Update The Academy of Management Review Upper Echelons Theory: An update. Source: The Academy of Management Review, 32(2), 334–343. http://www.jstor.org/stable/20159303%5Cnhttp://about.jstor.org/terms

Hambrick, D. C., & Mason, P. A. (1984). Upper Echelons: The Organization as a Reflection of Its Top Managers. Academy of Management Review, 9(2), 193–206. https://doi.org/10.5465/amr.1984.4277628

Hitt, M. A., Haynes, K. T., & Serpa, R. (2010). Strategic leadership for the 21 century. Business Horizons, 53(5), 437–444. https://doi.org/10.1016/j.bushor.2010.05.004

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Ireland, R. D., & Hitt, M. A. (1999). Achieving and maintaining strategic competitiveness in the 21st century: The role of strategic leadership. IEEE Engineering Management Review, 27(4), 51–64. https://doi.org/10.5465/ame.1999.1567311

Jaleha, A. A., & Machuki, V. N. (2018). Strategic Leadership and Organizational Performance: A Critical Review of Literature. European Scientific Journal ESJ, 14(35). https://doi.org/10.19044/esj.2018.v14n35p124

Jerab, D. A., Alper, M., & Baslar, A. (2012). The Impact of Core Competencies on Competitive Advantages & Success in Istanbul Tourists Companies. SSRN Electronic Journal, March. https://doi.org/10.2139/ssrn.1813163

Jooste, C., & Fourie, B. (2009). The role of strategic leadership in effective strategy implementation: Perceptions of South African strategic leaders. Southern African Business Review, 13(3), 51–68.

Kamya, M. T., & Ntayi, J. M. (2011). Organisational learning and competitive advantage : Testing for the interacting influence of knowledge management and innovation Organisational learning and competitive advantage : testing for the interacting influence of knowledge management and innovati. October. https://doi.org/10.1504/IJIL.2011.043097

Khan, S. Z., Yang, Q., & Waheed, A. (2019). Investment in intangible resources and capabilities spurs sustainable competitive advantage and firm performance. Corporate Social Responsibility and Environmental Management, 26(2), 285–295. https://doi.org/10.1002/csr.1678

Kim, M. S., & Thapa, B. (2018). Relationship of ethical leadership, corporate social responsibility and organizational performance. Sustainability (Switzerland), 10(2). https://doi.org/10.3390/su10020447

Le, H. M., Nguyen, T. T., & Hoang, T. C. (2020). Organizational culture, management accounting

information, innovation capability and firm performance. Cogent Business and Management, 7(1). https://doi.org/10.1080/23311975.2020.1857594

Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. Omega, 34(2), 107–124. https://doi.org/10.1016/j.omega.2004.08.002

Madhani, P. M. (2010). Resource Based View (RBV) of Competitive Advantages : Importance , Issues and Implications Resource Based View (RBV) of Competitive Advantage : An Overview.

Mahdi, O. R., & Almsafir, M. K. (2014). The Role of Strategic Leadership in Building Sustainable Competitive Advantage in the Academic Environment. Procedia - Social and Behavioral Sciences, 129, 289–296. https://doi.org/10.1016/j.sbspro.2014.03.679

Markoczy, L. (2015). G. P. Hodgkinson and P. R. Sparrow: The Competent Organization: A Psychological Analysis of the Strategic Management Process 2002, Buckingham: Open University Press (distributed by McGraw-Hill). 432 pages. 27(1), 154–157.

Mishra, M. (2016). Confirmatory Factor Analysis (CFA) as an Analytical Technique to Assess Measurement Error in Survey Research. Paradigm, 20(2), 97–112. https://doi.org/10.1177/0971890716672933

Mohammed, R. A., & Rugami, J. (2019). Competitive Strategic Management Practices and Performance of Small and Medium Enterprises in Kenya: A Case of Mombasa County. International Journal of Current Aspects, 3(VI), 193–215. https://doi.org/10.35942/ijcab.v3ivi.85

Nagaaba, N. (2020). Agile Enablers And Outcomes: Empirical Validation Of Agile Manufacturing Model In Developing Countries Context-Ugandan SME's Experience. 5(Ii), 1–21.

Nicholson, J., & Howard, K. (2018). A Study of Core Competencies for Supporting Roles in Engagement and Impact Assessment in Australia. Journal of the Australian Library and Information Association, 67(2), 131–146. https://doi.org/10.1080/24750158.2018.1473907

Olaka, M. H., Lewa, P. P., & Kiriri, D. P. (2017). Strategic Leadership and Strategy Implementation in Commercial Banks in Kenya. Journal of Strategic Management, 2(1), 70. https://doi.org/10.47672/jsm.285

Peteraf, M. A. (1993). The Cornerstones of Competitive Advantage : A Resource-Based View Author (s): Margaret A . Peteraf Published by : Wiley Stable URL : https://www.jstor.org/stable/2486921 The cornerstones of competitive advantage : a resource-based view. 14(3), 179–191.

Philippon, G. G. and T. (2018). Author (s): Germán Gutiérrez and Thomas Philippon Published by : American Economic Association Linked references are available on JSTOR for this article : Ownership , Concentration , and Investment. 108(May).

Prahalad, C. K., & Hamel, G. (1994). Strategy as a Field of Study: Why Search for a New Paradigm? C. K. Prahalad; Gary Hamel Strategic Management Journal, Vol. 15, Special Issue: Strategy: Search for New Paradigms. (Summer, 1994), pp. 5-16. Search, 15, 5–16.

Public, U. (2020). Business impact.

Revilla, A., & Fernández, Z. (2013). Environmental Dynamism, Firm Size and the Economic Productivity of R&D. Industry and Innovation, 20(6), 503–522. https://doi.org/10.1080/13662716.2013.833374

Rotemberg, J. J., Saloner, G., & Rotemberg, J. J. (2016). Visionaries , Managers , and Strategic Direction Published by : Wiley on behalf of RAND Corporation Stable URL : http://www.jstor.org/stable/2696355 Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use , available at Vi. 31(4), 693–716.

Savin, N. E., & White, K. J. (1977). The Durbin-Watson Test for Serial Correlation with Extreme Sample Sizes or Many Regressors Author (s): N . E . Savin and Kenneth J . White. Econometrica, 45(8), 1989–1996. http://www.jstor.org/stable/1914122

Schulz, S. A., & Flanigan, R. L. (2016). Developing competitive advantage using the triple bottom line: a

conceptual framework. Journal of Business and Industrial Marketing, 31(4), 449–458. https://doi.org/10.1108/JBIM-08-2014-0150

Serfontein, J. J. (2010). The Impact of Strategic Leadership on the Operational Strategy and Performance of Business Organizations in South Africa. Journal of Modern African Studies, 2(2), 98–105.

Shrestha, M. (2019). Contribution of Job Nature on Leadership Style among Academia. SEISENSE Journal of Management, 2(4), 1–13. https://doi.org/10.33215/sjom.v2i4.156

Srivastava, S. C. (2005). Managing Core Competence of the Organization. 30(4), 49–63.

Srivastava, S., Sultan, A., & Chashti, N. (2017). Influence of innovation competence on firm level competitiveness: an exploratory study. Asia Pacific Journal of Innovation and Entrepreneurship, 11(1), 63–75. https://doi.org/10.1108/apjie-04-2017-021

Taherdoost, H. (2017). Determining Sample Size ; How to Calculate Survey Sample Size 1 Survey Sample Size. 2.

Takiguchi, M. (2000). Role of HLA in HIV-1 infection. Uirusu. Journal of Virology, 50(1), 47–55. https://doi.org/10.2222/jsv.50.47

UBOS. (2020). 2020 Statistical Abstract. Uganda Bureau of Statistics, 1, 303. http://www.ubos.org/onlinefiles/uploads/ubos/pdf documents/abstracts/Statistical Abstract 2013.pdf

Wang, G., Holmes, R. M., Oh, I. S., & Zhu, W. (2016). Do CEOs Matter to Firm Strategic Actions and Firm Performance? A Meta-Analytic Investigation Based on Upper Echelons Theory. Personnel Psychology, 69(4), 775–862. https://doi.org/10.1111/peps.12140

Wang, H., Tsui, A. S., & Xin, K. R. (2011). CEO leadership behaviors, organizational performance, and employees' attitudes. Leadership Quarterly, 22(1), 92–105. https://doi.org/10.1016/j.leaqua.2010.12.009

Wernerfelt, B. (1984). A Resource-Based View of the Firm Author (s): Birger Wernerfelt Published by : Wiley Stable URL : https://www.jstor.org/stable/2486175 REFERENCES Linked references are available on JSTOR for this article : reference # references _ tab _ contents You may. 5(2), 171–180.

World Bank. (2020). Uganda Economic Update - Strengthening Social Protection to Reduce Vulnerability and Promote Inclusive Growth. 14th Edition February 2020, 65.

Zagreb, P. I. (2012). Theoretical Foundations and Measurement of Competitiveness. Poslovna Izvrsnost, 143–166.

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